

Mixed Analyte Performance Evaluation Program

Soil Sample MAPEP-02-S9
Performance Report

March 31, 2003

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MAPEP-02-S9 Performance Report

Summary

The U.S. Department of Energy's Radiological and Environmental Sciences Laboratory (RESL) administers the Mixed Analyte Performance Evaluation Program (MAPEP). MAPEP is the only PE program that targets radiological and non-radiological constituents (i.e., mixed analytes) from the same sample for quantification and analytical performance evaluation. MAPEP participants can efficiently demonstrate their proficiency in radiological, stable inorganic, and organic analyses from the same single blind MAPEP performance evaluation sample. MAPEP is performance based and does not dictate the analytical methodology.

The MAPEP-02-S9 soil sample was distributed to 74 laboratories in July 2002. The soil sample contained spiked inorganic metals, radiological components, and semi-volatile organic target analytes of interest to DOE facilities. With this distribution, 16 laboratories were also shipped a sample of soil containing only the volatile organic target analytes listed in the table below. Some analytes on the MAPEP-02-S9 sample description were not added to the soil sample. This allowed MAPEP to determine if any laboratories reported false positive results for these specific analytes. Natural uranium was also added to alter the expected specific activity of U-234 and U-238. These modifications were used to increase sample complexity and provide variation among MAPEP sample distributions. The soil sample contained the following target (including false positive test) analytes:

RADIOLOGICAL:

²⁴¹ Americium	¹³⁴ Cesium	¹³⁷ Cesium	⁵⁷ Cobalt	⁶⁰ Cobalt
⁵⁵ Iron	⁵⁴ Manganese	⁶³ Nickel	²³⁸ Plutonium	²³⁹ Plutonium
⁴⁰ Potassium	⁹⁰ Strontium***	²³⁴ Uranium	²³⁸ Uranium	⁶⁵ Zinc

STABLE INORGANIC:

Antimony	Arsenic	Barium	Beryllium***	Cadmium
Chromium	Lead	Nickel	Selenium	Silver
Thallium	Vanadium	Zinc		

ORGANIC:

cumene	1,2,4-trimethylbenzene	chloroform	1,2-dichloroethane	trichloroethene
<i>tert</i> -butylbenzene	toluene	1,1,2-trichloroethane	tetrachloroethene	<i>n</i> -butylbenzene
ethylbenzene	<i>p</i> -xylene	1,1,2,2-tetrachloroethane	1,3-dichlorobenzene	1,2-dichlorobenzene
1,2,4-trichlorobenzene	naphthalene	2,6-dichlorophenol	2-chloronaphthalene	2,6-dinitrotoluene
2,4-dinitrotoluene	diethylphthalate	hexachlorobenzene	phenanthrene	anthracene
1,4-dinitrobenzene	1,3-dinitrobenzene	pentachlorobenzene	pyrene	benzo(a)-anthracene
bis(2-ethylhexyl)-phthalate				

*** These analytes were not added and were used for false positive tests.

Nine of the original 74 laboratories that requested participation did not return data for this study. One laboratory closed permanently and the remaining eight laboratories did not report results for MAPEP-02-S9 prior to the closing deadline. Five of these eight were U.S. laboratories. Twelve (12) of the 15 foreign laboratories that were shipped samples returned analytical results and are part of the data package. Fifteen (15) of the 16 laboratories that received the volatile organics soil sample reported results. Appendix A of this report identifies the MAPEP participants and their reporting status for this test session.

The MAPEP studies have generated sufficient historical data to examine past performance. As a result of historical performance review, 15 laboratories were sent letters of concern pointing out potential quality issues that they may wish to address. These letters were sent to laboratories that demonstrated two consecutive failures or significantly biased (warning level) results for any given analyte.

MAPEP-02-S9 Performance Report

Mixed Analyte Performance Evaluation Program soil sample MAPEP-02-S9 was distributed in July 2002 to 74 analytical laboratories for the determination of radiological, inorganic, and/or semi-volatile organic constituents. Radiological analyses were performed with standard alpha, beta, and gamma detection methods. Inorganic and semi-volatile organic constituents were determined utilizing U.S. EPA SW-846 methods. A total of 65 laboratories reported results. The laboratory data and performance evaluation results are provided in this report. Analytical results for a volatile organics in soil test are also summarized.

SAMPLE PREPARATION AND DISTRIBUTION

Participants

MAPEP participants are identified by a unique laboratory code. The cross-references for these laboratory codes are found in Appendix A. Appendix A also lists the laboratories that participated in this performance evaluation study and serves as a list of participants that are consistently requesting MAPEP samples.

Sample Preparation

The Radiological and Environmental Sciences Laboratory (RESL) at the Idaho National Engineering and Environmental Laboratory (INEEL) prepared the base soil and final MAPEP-02-S9 sample. A soil obtained locally from the INEEL site was used as the base soil for MAPEP-02-S9. Forty (40) kilograms (kg) of performance evaluation (PE) material were prepared. This provided sufficient PE material for 120 jars of sample containing approximately 330 grams (g) of soil each.

Radiological, stable inorganic, and semi-volatile target analytes were blended into the base soil. RESL staff selected the spiking levels for the radionuclides, which were typically well above detection limits. The spiking levels for the inorganic and organic constituents were selected such that the sample could not be defined as a toxic solid waste according to the Code of Federal Regulations, Title 40, Part 261, Section 24. The spiking levels for the inorganic analytes were based on regulatory concentrations. The spiking levels for the semi-volatile organics were selected to be above the contract required quantitation limits listed in the U.S. Environmental Protection Agency's (EPA) Contract Laboratory Program Statement of Work for Organics Analysis OLM01.1 (12/90).

Sample Description - Radiological Analytes

Radionuclide solutions that were traceable to the National Institute of Standards and Technology (NIST) were added to 1 kg of the base soil already screened to 200 mesh. MAPEP routinely adds natural uranium and/or varies the isotopic ratios of the radionuclides, especially for the uranium isotopes. Natural uranium was spiked in this soil. The activity level for Postassium-40, however, reflects the concentration that naturally occurs in the base soil. The 1-kg plug was reground before blending to the final weight. Experimental determinations were performed to verify homogeneity and the final radionuclide concentrations. A false positive test for Strontium-90 was included in this performance evaluation study. The reference date for radioactive decay was January 1, 2002, 12:00 Mountain Standard Time (MST). RESL is directly traceable to NIST through participation in the National Analytical Management Program's Radiological Traceability Program.

Sample Description - Stable Inorganic Analytes

High purity standards of antimony, arsenic, barium, cadmium, chromium, lead, selenium, silver, thallium, and vanadium were purchased from a supplier of inorganic standards. The supplier was required to provide a certificate of analysis for each compound documenting the element concentration, NIST traceability, and concentration uncertainty. NIST also verified the element concentrations in a mixture of the commercial standards. The element standard solutions were used to prepare a 1-kg plug of concentrated mixed inorganic soil. A false positive test was performed for beryllium.

Sample Description - Semi-volatile Organic Analytes

Known amounts of high purity semi-volatile organic standards were purchased and added to the MAPEP-02-S9 soil (see Table 1). The supplier of the standards provided gravimetric certification of the weight of each component and their purity. To prepare the semi-volatile organic soil, a 0.5-kg portion of base soil was slurried with methylene chloride in the sample flask of a rotary evaporator system. Measured amounts of the standards were added to the slurry. The sample flask was immersed in a cold-water bath and rotated for 24 hours to mix the analytes with the base soil. The sample flask was then warmed slowly to evaporate the methylene chloride until the soil was free flowing. The methylene chloride collected was recombined with 0.5 kg of clean soil and reslurried for four hours. The sample flask was again slowly warmed to evaporate the methylene chloride. The two 0.5-kg samples of soil were combined in a single wide-mouth 1-liter jar and mixed. The methylene chloride collected in the condensation flask was analyzed for the spiked semi-volatile organics to check for losses from the soil during the evaporation process. The following table details the amount of each target analyte added in the methylene chloride solvent.

Table 1. Amount of semi-volatile organic analytes added to the 1.0-kg soil plug used to prepare the MAPEP-02-S9 soil sample.

Component	Purity	Actual mg. Added
1,3-dichlorobenzene	98%	36.25
2,4-dimethylphenol	97%	58.12
1,2,4-trichlorobenzene	99%	37.65
naphthalene	99%	41.5
1,2-dichlorobenzene	99%	35.13
2,6-dichlorophenol	99%	43.50
2-chloronaphthalene	99%	40.15
2,6-dinitrotoluene	99%	40.50
2,4-dinitrotoluene	97%	44.08
diethylphthalate	99%	40.03
hexachlorobenzene	99%	35.55
phenanthrene	99%	40.06
anthracene	99%	46.26
1,4-dinitrobenzene	98%	44.30
1,3-dinitrobenzene	97%	36.90
pentachlorobenzene	98%	37.70
pyrene	98%	44.01
benzo(a)anthracene	99%	43.77

The 1-kg semi-volatiles organic soil plug was added to the final MAPEP-02-S9 soil sample. The spiked plugs and base soil were combined in a 5-cubic foot V-blender with pin-intensifier bar and blended for four hours. The sample was dispensed into 0.5-liter size wide-mouth glass jars with Teflon lined lids with each

jar containing about 330 grams of soil. The outsides of the jars were wiped clean and labels affixed. Custody seals were applied over the lids. The jar numbers corresponded to the filling sequence of the jars. The jars of sample were stored in a freezer at 4°C in the RESL CFA-690 Building until distribution to the participants.

Sample Description - Volatile Organic Analytes

A known mixture of solvents consisting of *iso*-octane (used as a diluent and not intended as a target analyte), chloroform, 1,2-dichloroethane, trichloroethene, toluene, 1,1,2-trichloroethane, tetrachloroethene, ethylbenzene, *p*-xylene, cumene, 1,1,2,2-tetrachloroethane, *tert*-butylbenzene, 1,2,4-trimethylbenzene and *n*-butylbenzene was encapsulated. The capsules were dried and sieved to pass an 80-mesh screen. A portion of the sieved capsules (2.00 grams) was added to 500 grams of INEEL soil and mixed to create a potential performance evaluation standard for volatile organics.

Five-gram portions of this soil were weighted out into individual 40-mL VOA vials and distributed to 16 laboratories with instructions for sample preparation and analysis.

MAPEP-02-S9 Reference Values

Reference values and uncertainties for this study can be found in Appendix D. The radiological reference values incorporate the total uncertainty of the NIST traceable standard and the sample preparation methodology. The uncertainties are reported at one standard deviation. The inorganic uncertainties were derived from the results of the EPA Methods 3050 and 3051 experimental determinations at one standard deviation. The reference values for the organic target analytes were determined as the Biweight mean of all laboratory data for the analyte. The organic reference value uncertainties are derived from the data reported by the participating laboratories and represent the 95% confidence interval for the mean of the data (excluding outliers). This calculation is analogous to the classical confidence interval for the mean of a population:

$$T_{bi} \pm \left(t_{(0.95,n-1)} \right) * \frac{S_{bi}}{\sqrt{n}}$$

Where T_{bi} = Biweight mean

S_{bi} = Biweight standard deviation

n = number of observations

$t_{(0.95,n-1)}$ = Student's t value at the 95% confidence interval and $n-1$ degrees of freedom.

LABORATORY RESULTS

Data Treatment

The data received from the laboratories are listed in Appendices B and C. Estimates of the mean and standard deviation are calculated using traditional statistical calculations. The Statistical Summary in Appendix B shows the overall performance of the 65 reporting laboratories for each of the target analytes. In this summary, the 'T(1)' column displays the total number of laboratories reporting data for a particular analyte. The 'A(2)' column displays the total number of laboratories with acceptable data that were used to develop the grand mean and standard deviation in the subsequent columns. The Acceptance Range identifies the values that delineate acceptable performance. The radiological and stable inorganic data that were outside the $\pm 30\%$ acceptance window are not included in the mean and standard deviation calculations. Additionally, the grand mean generated in the Summary Report does not include inorganic results that were determined as the total analyte present. These data were treated separately and

evaluated utilizing reference values for the total analyte concentration. The laboratories that used a total analyte methodology received the results of this separate evaluation in their individual laboratory performance report. For the organic target analytes, the grand mean and standard deviation are the Biweight mean and standard deviation respectively.

Performance reports for each laboratory follow the Statistical Summary. These reports are arranged by laboratory code in alphabetical order. The reference value for each analyte, the reported value, and the performance evaluation are presented. The Uncertainty Flag observed in the last column of these reports will be either 'L' for potentially low or 'H' for potentially high. The Uncertainty Flag is utilized in this program for information only. The acceptance criteria used for this performance evaluation are defined in Table 2.

Table 2. Acceptance criteria.

FLAG	MEANING	CRITERIA FOR RADIOLOGICAL AND INORGANIC ANALYTES	CRITERIA FOR ORGANIC ANALYTES
"A"	Acceptable	Bias <= 20%	Absolute value of Z-score <= 2.0
"W"	Acceptable with Warning	20% < Bias <= 30%	Absolute value of Z-score 2.0 < Z-score <= 3.0
"N"	Not Acceptable	Bias > 30%	Absolute value of Z-score > 3.0

Results for this study are graphically presented in Appendix C. The data for each analyte are plotted against the reference value and the grand mean. The laboratory codes are displayed along the X-axis. The error bars associated with each data point are the individual uncertainties for the measurement reported by the laboratory. Laboratories that did not report data for a particular analyte are not plotted or labeled.

Due to analyte concentrations, laboratory uncertainties and data scatter, the Y-axis varies widely throughout the graphs. Utilization of visual data scatter without consideration for the concentration range displayed may lead a reviewer to a false conclusion concerning sample homogeneity or inaccuracy of a data set. In most cases, the graphs have been scaled to present the best visual picture of the data set.

Radiological Analytes

The number of laboratories reporting results for the alpha-emitting radionuclides ranged from 34 (for U-234) to 39 (for Pu-239). Eleven (11) laboratories received "Warning" or "Not Acceptable" performance evaluations for the determination of the alpha-emitting radionuclides (see Table 3). The determination of Am-241 proved to be the most problematic, with 6 of 38 labs (16%) receiving "Not Acceptable" or "Warning" performance evaluations. Gamma-ray spectrometry was used as the method of detection in four of these six flagged Am-241 results. This is consistent with previous studies that have also demonstrated potential problems with this methodology for Am-241 analyses. In this test session, 4 of 12 laboratories (33%) that used gamma-ray spectrometry for the determination of Am-241 showed "Not Acceptable" or "Warning" level performance. Two of 26 reporting laboratories (8%) showed "Not Acceptable" or "Warning" level performance for the determination of Am-241 by alpha spectrometry. The mean absolute bias of Am-241 results determined by gamma-ray spectrometry was 18.0% with a standard deviation of 17.4% (n=12). The mean absolute bias for Am-241 results determined by alpha spectrometry was 6.3% with a standard deviation of 7.0% (n=26). The non-destructive methodology of gamma-ray spectrometry is desirable, but it is advantageous only if acceptable performance is consistently achieved. While some laboratories have performed well, others are struggling to consistently achieve good results for the determination of Am-241 by gamma-ray spectrometry.

MAPEP typically adds natural uranium or varies the isotopic ratios of U-234 and U-238 to provide additional

sample complexity and variation among test sessions. The MAPEP-02-S9 soil sample was spiked with natural uranium. One laboratory showed "Not Acceptable" performance for both U-234 and U-238 determinations, one laboratory received a "Warning" for each, one lab a "Warning" for U-234 only, and another lab a "Warning" for U-238 only (see Table 3). One laboratory showed "Not Acceptable" and another laboratory "Warning" performance for Pu-238. The same was true, with different laboratories, for Pu-239. All flagged results were negatively biased except for three Am-241 determinations (all performed by gamma-ray spectrometry) and one Pu-238 result. Overall, 169 of 185 actinide determinations (91%) were at the "Acceptable" level of performance.

Gamma analyses were requested for Co-57, Cs-134, Cs-137, Mn-54, Zn-65, Co-60, and K-40. These seven radionuclides together emit gamma rays across the energy spectrum from 122 keV to 1461 keV. Thirteen (13) laboratories received "Warning" or "Not Acceptable" performance evaluations for gamma results (see Table 4). CESL01 appeared to have a systematic or data reporting error, receiving a "Not Acceptable" performance evaluation for all reported gamma results. Performance flags given for the gamma-emitters were: Co-57 (2N, 5W, 41A), Cs-134 (2N, 3W, 45A), Cs-137 (1N, 0W, 49A), Mn-54 (1N, 6W, 42A), Zn-65 (2N, 6W, 40A), Co-60 (2N, 4W, 42A), and K-40 (1N, 1W, 42A). The gamma-emitters showing the most "Not Acceptable" and "Warning" flags were Co-57 (7 flags), Mn-54 (7 flags), and Zn-65 (8 flags). Except for the Cs-134 and the ANLA Co-57 results, all other "N" and "W" flagged results were biased high when compared to their respective reference values. If the CESL01 results are omitted, the remaining Cs-134 flagged results are all biased low (see Table 4).

The positive bias for high-energy gamma-emitters such as Mn-54 and Zn-65 can result from the random and coincident summing associated with common mixed-gamma efficiency calibration standards (e.g., Y-88 and Co-60 gamma emissions). The efficiency calibrations at 898 keV (Y-88) and 1173 keV (Co-60) are both near the Mn-54 key-line energy of 835 keV and the Zn-65 key-line energy of 1116 keV. An efficiency curve that is calibrated for Y-88 and Co-60 may interpolate efficiencies for Mn-54 and Zn-65 that are significantly lower than the actual Mn-54 and Zn-65 efficiencies. Therefore, the calculated result for Mn-54 and Zn-65 will show a positive bias. The magnitude of the positive bias is dependent on the summing losses associated with the efficiency curve. Likewise, the negative bias for Cs-134 is most likely due to the coincident summing of the 605 keV and 796 keV gamma emissions of Cs-134. The counts lost from the 605 keV full-energy peak cause the specific activity of Cs-134 to be underestimated. The random and coincident summing affects increase with greater detector efficiency. The positive bias associated with the Co-57 flagged results may be associated with an over correction for mass attenuation affects. These scenarios are, however, speculative. Overall, 301 of 337 determinations (89%) for gamma-emitting radionuclides were at the "Acceptable" level of performance.

The MAPEP program uses false positive testing on a routine basis to identify laboratory results that indicate the presence of a particular radionuclide in a MAPEP sample when, in fact, the actual activity of the radionuclide is far below the detection limit of the measurement. For this study, a false positive test was performed for Sr-90. Acceptable ("A") performance was indicated when the range encompassing the result, plus or minus the total uncertainty at three standard deviations, included zero (e.g., 0.5 +/- 0.2; range of -0.1 to 1.1). Not Acceptable ("N") performance, and hence a false positive result, was indicated when the range encompassing the result, plus or minus the total uncertainty at three standard deviations, did not include zero (e.g., 2.5 +/- 0.2; range of 1.9 to 3.1). Statistically, the probability that a result can exceed its total uncertainty at three standard deviations by chance alone is less than 1%. A three standard deviation criterion was used for the false positive test to maximize confidence in a reported detection. A result that is greater than three times its total uncertainty cannot, by most definitions, be below the detection limit.

Four of 24 reporting laboratories (17%) showed statistically positive results for Sr-90 (see Table 5). This is an improvement over the last Sr-90 false positive test in soil (MAPEP-99-S6), where 10 of 28 laboratories (36%) reported a false positive result. All four laboratories reporting false positive results in the current test session were foreign laboratories. The majority of reporting laboratories used gas flow proportional counting and a sample size of 10 grams or less. Three of the four laboratories that reported statistically positive results used a sample size exceeding 10 grams. Perhaps some interference becomes noticeable at larger sample sizes. False positive results frequently initiate costly investigations, necessitate additional sampling

and analyses, jeopardize data integrity, needlessly alarm the public and/or erode public confidence, and can activate a host of other unnecessary responses and expenditures. False positive results have a direct impact on the taxpayer cost of site characterization, remediation, closure, and long-term stewardship. Therefore, consistently poor performance on false positive tests is an important quality concern.

The other targeted beta-emitting radionuclides were Fe-55 and Ni-63. Four laboratories reported results for Fe-55 and 12 laboratories reported results for Ni-63. Only one laboratory received a “Not Acceptable” performance evaluation for Fe-55 and one laboratory received a “Warning” evaluation for Ni-63 (see Table 6). Both of these results were negatively biased. Liquid scintillation counting was the primary method of detection for both Fe-55 and Ni-63. The sample size was typically less than five grams.

Table 3. Laboratories that showed “Warning” or “Not Acceptable” performance evaluations for the determination of alpha-emitting radionuclides. The percent bias from the reference value is given in parentheses.

LABORATORY CODE	WARNING	NOT ACCEPTABLE
AY1201		Am-241 (-30.3%)
		Pu-238 (34.5%)
CORE02	Pu-239 (-27.7%)	
IPHT99	U-238 (-23.3%)	
LEPD99	Am-241 (27.6%)	
MDPH01		Am-241 (-35.6%)
		Pu-239 (-83.5%)
OTLI01		U-234 (-70.4%)
		U-238 (-66.1%)
RSIR99		Am-241 (64.0%)
SOUT01	Am-241 (21.6%)	
TELE02	U-234 (-27.4%)	
	U-238 (-22.8%)	
TMAR01	Am-241 (-22.8%)	
UPVL99	Pu-238 (-23.6%)	
	U-234 (-20.9%)	

Table 4. Laboratories that showed “Warning” or “Not Acceptable” performance evaluations for the determination of gamma-emitting radionuclides. The percent bias from the reference value is given in parentheses.

LABORATORY CODE	WARNING	NOT ACCEPTABLE
ANLA01		Co-57 (-50.0%)
CESL01		Co-57 (163.4%)
		Cs-134 (111.1%)
		Cs-137 (166.7%)
		Mn-54 (185.7%)
		Zn-65 (197.9%)
		Co-60 (175.4%)
		K-40 (160.7%)
	Mn-54 (23.4%)	
CSTL01	Zn-65 (26.9%)	
	Co-57 (21.2%)	
	Mn-54 (24.4%)	
	Zn-65 (27.8%)	
HWRL01	Co-60 (21.2%)	
	Cs-134 (-25.8%)	
MART03	Co-57 (21.5%)	
	Mn-54 (21.3%)	
NESI01	Zn-65 (27.3%)	
	Co-60 (25.7%)	
OBGL01	Cs-134 (-21.4%)	
PRAP01	Co-57 (23.1%)	
	Zn-65 (22.3%)	
SNEC01	Cs-134 (-23.0%)	
SOUT01	Co-57 (29.8%)	Zn-65 (32.8%)
	Mn-54 (25.2%)	Co-60 (31.9%)
	K-40 (25.4%)	
TELE01	Mn-54 (24.4%)	
	Zn-65 (26.1%)	
	Co-60 (24.6%)	
TMAE01	Co-57 (20.7%)	
	Mn-54 (23.8%)	
	Zn-65 (23.0%)	
	Co-60 (24.6%)	
WEST03		Cs-134 (-30.4%)

Table 5. Laboratories that reported a false positive result for Sr-90.

Lab Code	Result (Bq/kg)	Total Uncertainty	Statistically Positive ¹
DINL99	0.56	0.09	6.4
LEPD99	9.80	2.70	3.6
RSIR99	14.90	3.09	4.8
UPVL99	0.57	0.09	6.3

1) For this study, a statistically positive result is indicated if the (RESULT / UNCERTAINTY) > 3.0. The result and total uncertainty are rounded to two decimals in the table for readability, but the number of standard deviations listed is calculated from the results as reported.

Table 6. Laboratories that showed “Warning” or “Not Acceptable” performance evaluations for the determination of beta-emitting radionuclides. The percent bias from the reference value is given in parentheses.

LABORATORY CODE	WARNING	NOT ACCEPTABLE
DINL99		Sr-90 (False +)
LEPD99		Sr-90 (False +)
RSIR99		Sr-90 (False +)
TELE02	Ni-63 (-24.5%)	
UPVL99		Sr-90 (False +)
WEST04		Fe-55 (-41.4%)

Stable Inorganic Analytes

Not all of the stable inorganic analytes listed in the Sample Description were spiked into the MAPEP-02-S9 soil. Beryllium was not added to the MAPEP-02-S9 soil, but the base soil did contain a background concentration of about 0.95 mg/kg. False positive flags were assigned if beryllium results were reported above the lower concentration range of 10 mg/kg as stated on the Sample Description for the MAPEP-02-S9 soil. All 18 reporting laboratories provided beryllium values that were less than 10 mg/kg and therefore received “Acceptable” performance evaluations for the beryllium false positive test. Fourteen (14) laboratories reported their actual beryllium measurements and four laboratories reported “less than” values. For information purposes, the reported measurements can be compared to the beryllium base soil concentration of 0.95 mg/kg. If the traditional MAPEP acceptance criteria are applied, 10 laboratories showed “Acceptable”, 3 “Warning”, and 2 “Not Acceptable” (1 “less than” value was a false negative) evaluations. This indicates that even though all laboratories passed the false positive test for beryllium, several laboratories appear to have problems with the actual beryllium determination. For the remaining analyses, 21 laboratories received “Warning” or “Not Acceptable” performance evaluations for their stable inorganic results (see Table 7).

Selenium showed the greatest percentage (5 of 29 laboratories = 17%) of “Not Acceptable” evaluations for the stable inorganic analytes (5N, 3W, 21A, see Table 7). The “Not Acceptable” selenium results were biased both high and low. There was insufficient data to indicate a high or low bias trend specific to

instrument or sample preparation technique for selenium. The other stable inorganic analytes with the greatest number of "N" or "W" performance flags were Pb (2N, 4W, 28A), Ti (4N, 1W, 25A), V (3N, 4W, 25A), and Zn (3N, 2W, 28A). Silver showed three "N" flagged evaluations, two from laboratories that reported false negative results (see Table 7). The best overall performance was seen in the determination of chromium, with all 34 reporting laboratories demonstrating "Acceptable" performance.

Antimony (Sb) was spiked into the MAPEP-02-S9 soil but was not listed on the sample description, and therefore no performance evaluation flags were given for Sb. The Sb reference value was 18.5 ± 0.1 mg/kg. Two laboratories reported results for Sb of 1.2 and 2.3 mg/kg. These two results were much lower than the spiked reference value and illustrate a potential problem with the antimony determinations. The standard digestion as described in SW-846 Method 3050B will not adequately digest the Sb. It is necessary to perform the digestion in accordance with section 7.5 of EPA Method 3050B for improved solubility. When section 7.5 of 3050B is used for sample preparation, acceptable performance in the determination of Sb can be attained.

The majority of the data reported ($n = 312$ observations) for this performance evaluation sample originated from three instrumental analytical techniques: radial ($n = 98$) and axial ($n = 144$) view Inductively Coupled Plasma Emission Spectrometry (ICPES), and Inductively Coupled Plasma Mass Spectrometry (ICPMS, $n=38$). The majority of sample preparation techniques for all analytes were EPA SW-846 Method 3051 (microwave assisted, $n = 66$) and EPA SW-846 Method 3050 (hot plate digestion, $n = 224$).

A review of all the stable inorganic data (including outliers) from this test session suggests some general and analyte dependent observations. These casual observations are applicable to this test session only and do not represent an exhaustive evaluation. An evaluation of precision based on instrumental technique, as defined by the relative standard deviation of the reported result for each analyte by instrumental detection method, provides the following observations: the ICPMS out performed or matched the other techniques for Ag, Ba, Cd, Pb, Ni, Ti, V, and Zn. Radial view ICPES out performed or matched the other techniques for As, Ba, Cd, Cr, and Zn. Axial view ICPES out performed or matched the other techniques for Ba, Be, Se, and Zn. Flame Atomic Absorption Spectrometry (FAAS) could only match the precision of the other techniques for Cd and Se. A comparison of detection methods should also consider the sample preparation technique used to support the detection method, since the sample preparation may contribute more error than the detection instrument itself. Valid comparisons must ensure that the detection methods are fairly tested without being unduly influenced by the differences in sample preparation techniques. A more extensive statistical analysis of the data reveals no significant difference in variation among the detection methods at the 95% confidence level.

An evaluation of accuracy based on instrumental technique, defined as the mean percent bias of the reported result for each analyte by instrumental detection method, provides the following observations: ICPMS showed an average of +7.8% (+3.4% after outliers are removed) high bias for As, Be, Pb, Ni, Se, and Ti. Radial view ICPES revealed an average of -7.6% (-5.0% after outliers are removed) low bias for Ag, Ni, and Ti. Axial view ICPES demonstrated low bias on Zn (-5.1%). FAAS provided high bias on Ni (+5.4%) and low bias on Ag (-7.6%) and Ba (-0.7%). There was not, however, a statistically significant bias associated with FAAS or ICPMS at the 95% confidence level. For the limited data of this test session, radial and axial view ICPES exhibited significant negative bias at the 95% confidence level. Caution must be used, however, in the interpretation of this observation since sample preparation may contribute more error than the instrument of choice.

Microwave digestion showed low recovery and poor precision on V and Zn. It provided high recovery and poor precision on Se and Ti. High recovery was observed for Be and Pb. A more rigorous analysis, however, revealed no statistically significant differences for these determinations at the 95% confidence level. Microwave out performed hot plate digestion on Cd, but again there was not a statistically significant difference in variance or performance at the 95% confidence level. Hot plate digestion gave good precision and accuracy for all analytes. Overall, microwave ($n = 66$, mean = -1.1%) and hot plate digestion ($n = 224$, mean = -3.2%) showed no statistically significant difference in performance based on the variance of the data. For this test session, the data suggest that hotplate methods tended to give negatively biased results

compared to microwave digestion, which appeared to be unbiased overall.

Three laboratories (CCEN99, LPTO99, and RSIR99) used digestion or instrumental techniques that provided results for the total analyte concentration present. These laboratories were evaluated separately against reference values based on the total analyte concentration. One laboratory utilized Neutron Activation. One laboratory utilized a sulfuric/perchloric acid digestion coupled with Graphite Furnace Atomic Absorption Spectrometry (GFAAS). The final laboratory utilized a nitric/hydrofluoric acid digestion coupled with FLAAS. All reported results were at the "Acceptable" level of performance.

Three laboratories (AY1201, MART02, RSIR99) reported total uranium or the uranium isotopes in the inorganic analytes section. One laboratory analyzed MAPEP-02-S9 for uranium isotopes by ICPMS and two by Thermal Ionization Mass Spectrometry. All uranium results were within acceptable ranges, but one laboratory (MART02) showed an "Acceptable with Warning" level of performance for the total uranium determination.

Table 7. Laboratories that showed “Warning” or “Not Acceptable” performance evaluations for the determination of stable inorganic analytes. The percent bias from the reference value is given in parentheses.

LABORATORY CODE	WARNING	NOT ACCEPTABLE
ANLA01		V (30.2%)
BNEL01	Se (24.9%)	Pb (41.5%)
	Tl (-23.5%)	Ag (False -)
	V (-26.5%)	
CCEN99		Se (-48.1%)
CEEA99		Ba (-37.4%)
ERCL01		Ba (-92.1%)
		Ni (-31.3%)
		Se (-53.6%)
		Tl (-51.4%)
		V (-44.2%)
		Zn (-41.9%)
ERMI01	Pb (-21.3%)	
GROW01	Cd (-21.3%)	
HISL99	Zn (-23.0%)	
HWRL01	V (28.0%)	Tl (-32.0%)
IBTN99		Cd (-93.0%)
		Ni (34.6%)
		Se (38.7%)
		Ag (False -)
LPTO99		Tl (30.02%)
MART01	As (-21.7%)	Pb (50.9%)
	Cd (29.5%)	Zn (47.7%)
MART02	Pb (-28.1%)	Tl (-47.5%)
	Ni (27.5%)	
	U-Total (-28.6%)	
MOUN01	Pb (-23.1%)	
	Se (-24.3%)	
NESI01	V (-28.4%)	Ag (-49.9%)
NMLA01	As (23.7%)	Cd (30.6%)
	Se (29.2%)	Zn (-32.1%)
OTLI01		V (-33.7%)
RECC01	Pb (-25.7%)	
ROCK01		Se (41.8%)
SOUT01	V (-21.0%)	
	Zn (-27.1%)	
WEST03		Se (151.4%)

Semi-Volatile Organic Analytes

The statistical treatment of the raw data was conducted following protocols developed by the EPA EMSL-CIN for the WP and WS laboratory proficiency testing programs. Reference values were calculated for each analyte by using EPA EMSL-CIN Biweight computer algorithms to determine the Biweight mean and Biweight standard deviation for each analyte. The lower and upper 95% prediction interval (PI) and the lower and upper 95% confidence interval (CI) were also determined.

Each laboratory was evaluated on an analyte by analyte basis using Z-scores as recommended by the

International Standards Organization (ISO), "International Harmonized Protocol for the Proficiency Testing of (Chemical) Analytical Laboratories". The Z-Score was calculated as the laboratory result minus the Biweight mean divided by the Biweight standard deviation. The resulting Z-score may either be positive or negative. A laboratory was considered to be Acceptable ("A") in the analysis of the analyte if the absolute value of the Z-score did not exceed 2.0 (i.e., less than or equal to two standard deviations from the mean). If the absolute value of the Z-score was greater than 2.0, but less than or equal to 3.0, the result was considered acceptable, but flagged as a Warning ("W"). Results were Not Acceptable ("N") if the absolute value of the calculated Z-score was greater than 3.0.

Some laboratories may be graded on false negative and false positive data for this study. False negative data are associated with laboratories that did not report analyte values (or reported as less than values) for organic analytes that by consensus were determined to be present in the sample. MAPEP has determined that some analytical laboratories do not calibrate for all the components present in the target analyte list in U.S. EPA SW-846 Method 8270 "Semi-volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) Capillary Technique". For this reason, MAPEP will not flag results as "False Negative" nor assign a performance flag unless there is a clear indication of error in isomer determination/reporting.

A false positive flag was issued to laboratories that reported organic analytes that by consensus were found not to be present in the sample. The value reported by the laboratory was compared to the method specific detection limit. If the reported value was less than or equal to two times this detection limit, the laboratory was given a "Warning" flag (i.e., proficient). If the reported value was greater than two times the detection limit, the reported data were flagged as a false positive result and the laboratory was given a "Not Acceptable" performance evaluation.

Consensus in this context means the number of laboratories (*n*) that define the 95% Prediction Interval (or acceptance limits). The number of laboratories will exclude those laboratories reporting data considered as outliers. For MAPEP-02-S9, *n* = 21. Phthalates were not included in these determinations unless there was conclusive evidence that a false positive value existed.

This sample distribution contained 17 semi-volatile target analytes. Twenty-one (21) laboratories analyzed the sample for semi-volatile organics. Of the 21 laboratories reporting semi-volatile organics results, most reported diethylphthalate and bis(2-ethylhexyl)phthalate. These organic components were not added to the MAPEP standard, but by consensus of the participating laboratories diethylphthalate and bis(2-ethylhexyl)phthalate were added to the analyte list.

The constituent 2,4-dimethylphenol was added to the soil standard but was not identified by any of the 21 reporting laboratories. Only five laboratories reported the target constituent 1,4-dinitrobenzene and seven reported 1,3-dinitrobenzene. Actual performance data are reflected in both the summary statistics report and in the individual laboratory performance report. One laboratory incorrectly identified the 1,3-dichlorobenzene isomer and received a false positive (i.e., "Not Acceptable") performance evaluation.

The majority of the laboratories analyzed the soil sample utilizing SW-846 Method 3550 Ultrasonic Extraction, with no sample clean up and quantitated per SW-846 Method 8270. The typical sample size was between 11 and 30 grams of soil. There was no trend identified in the data supplied by the laboratories, and no single laboratory failed all performance criteria.

Volatile Organic Analytes

With this test session, the MAPEP provided 16 laboratories with a soil sample containing volatile organic constituents. Fifteen (15) of the 16 laboratories reported results for the VOA standard, and these data are included in the volatile organic portion of this study. Prior to shipment of the standard, RESL analyzed the prepared VOA standard in triplicate over approximately a 30-day period. The resulting 21 data points were statistically analyzed. The RESL analytical data are reported here to demonstrate the homogeneity of the

sample and for comparison with the participants' data. The mean, standard deviation and standard deviation for the mean were derived from the RESL data after removing the three highest and three lowest values for each target analyte (see Table 8).

Each reference value (Biweight mean) for the targeted volatile organic analytes was based on the actual results reported by the participants. The analytical data from the participating laboratories generally supports the RESL determination values, but were more scattered than expected (see Table 9). Data scatter was an initial concern for this study based solely on the type of performance standard (encapsulated solvents) being distributed and the unique characteristics of the standard. RESL and the participating laboratories did not detect chloroform and 1,2-dichloroethane, indicating significant losses for these two constituents during the encapsulation process. Instructions were shipped with each standard indicating how the sample was to be prepared prior to analysis and that the homogeneity of the standard could not be assured below the 5.0-gram level. The instructions noted that the standard required contact with water at least overnight prior to the analysis. The contact time is important to 'break' the shell encapsulating the volatiles mixture, thereby releasing the mixture to the soil matrix. The reported results, however, suggest that: 1) some laboratories did not wait the sufficient amount of time after adding the water before the sample was analyzed, and 2) some laboratories analyzed less than the 5.0-gram sample distributed.

For most target VOA analytes, the Biweight mean for the reported results was less than the RESL determined mean value (see Tables 8 & 9). Only cumene and 1,1,2,2-tetrachloroethane showed greater reported values than the RESL results. In early work performed with the volatile organics standards at RESL, it was noticed that lower concentration values were often observed when the sample was not in contact with the added water (or other solvents per EPA Methods) for a sufficient amount of time. If the sample was analyzed relatively soon after the addition of water, the encapsulating shell was not broken and the volatiles mixture was not completely released, causing low recovery. This may potentially explain the lower concentrations reported by some of the participating laboratories.

As can be seen from the RESL values in Table 8, the standard appears to be relatively homogeneous. None of the data seen or eliminated by RESL during the sample analysis included concentration values as high as those data returned by the laboratories. At present, RESL cannot explain these higher values and can only offer to perform more research to ascertain whether or not these values are achievable utilizing alternative sample preparation methods.

No laboratory failed the volatile organics portion of this test session, due to the large scatter in the reported analytical data, and because this volatile organics standard is relatively new for the MAPEP program. Laboratory data initially reported outside the acceptable performance limits were changed from "Not Acceptable" to "Acceptable with Warning". According to the method codes reported by the laboratories, sample preparation was mainly by US EPA Method 5030B "Purge-and-Trap for Aqueous Samples (Method 5030B)" and "Closed-System-Purge-and-Trap and Extraction for Volatiles (Method 5035)".

Table 8. RESL analysis of the VOA standard.

Target Analyte	Mean	Std. Dev	Std. Dev. Mean	% RSD
<i>iso</i> -octane (diluent)	78.5	9.3	6.5	11.8
Trichloroethene	44.6	13.2	3.8	29.7
Toluene	18.3	5.3	1.9	29.0
1,1,2-trichloroethane	76.5	3.5	2.0	4.6
Tetrachloroethene	146.6	5.8	4.1	4.0
Ethylbenzene	180.9	14.9	6.4	8.2
<i>p</i> -xylene	162.7	32.9	11.0	20.2
Cumene	215.1	20.6	13.3	9.6
1,1,2,2-tetrachloroethane	768.6	149.1	103.7	19.4
<i>tert</i> -butylbenzene	313.6	52.0	59.9	16.6
1,2,4-trimethylbenzene	380.9	93.6	33.4	24.6
<i>n</i> -butylbenzene	251.6	50.3	35.3	20.0

Table 9. Summary of the VOA data received from the participating laboratories.

Target Analyte	N	Biweight Mean	Biweight Std. Dev	Std. Dev. Mean	Min. Value	Max. Value
trichloroethene	11	26.6	23.0	9.4	6.12	150.0
toluene	13	18.3	14.6	3.7	2.9	93.3
1,1,2-trichloroethane	15	64.8	22.9	6.0	12.1	87.0
tetrachloroethene	15	114.2	80.6	21.5	9.5	252.0
ethylbenzene	15	130.3	96.8	24.7	12.3	307.0
<i>p</i> -xylene	15	153.7	118.4	30.4	13.6	374.0
cumene	10	236.8	260.4	93.9	11.5	734.0
1,1,2,2-tetrachloroethane	15	971.8	508.8	126.5	126.0	1430
<i>tert</i> -butylbenzene	13	107.4	102.7	21.7	9.5	1200
1,2,4-trimethylbenzene	13	214.2	253.8	80.8	15.6	1110
<i>n</i> -butylbenzene	13	78.6	73.7	16.7	5.2	1620

APPENDIX

A

**Participating Laboratories and Associated
Laboratory Code Index
for MAPEP-02-S9**

MAPEP-02-S9 Reporting Participants

Lab Code	Laboratory Name
ANLA01	Argonne National Laboratory Analytical Chemistry Lab.
ANTE01	Paragon Analytics, Inc.
ARGO01	Argonne National Laboratory West
ARSL01	American Radiation Laboratory
AY1201	Y-12 Analytical Services Organization
BNEL01	BINAX / NEL
CCEN99	Comision Chilean de Energia Nuclear, Santiago de Chile
CDHS01	California State Department of Health Services
CEEA99	Comision Ecuatoriana de Energia Atomica, Quito, Ecuador
CESL01	Lawrence Livermore National Laboratory
CORE02	Core Laboratories
CSTL01	CST-9, Los Alamos National Laboratory
DINL99	Departamento Ingenieria Nuclear
EMBW01	B&W Of Ohio, Inc.
EPAL01	Office of Radiation and Indoor Air - Radlab
ERCL01	Environmental & Radiation Chemistry, PHL
ERMI01	RMI Environmental Services
GENE01	General Engineering Laboratories
GROW01	Fruit Growers Laboratory
HISL99	Samples returned – laboratory failed to retrieve from customs
HWRL01	Lawrence Livermore National Laboratory
IBTN99	Instituto Boliviana De Ciencia y Technologia Nuclear, La Paz, Bolivia
IHPH99	Radiation Hygiene Laboratory, Institute of Public Health
IPHT99	Inst. Of Public Health Timisoara
LAWR01	Lawrence Berkeley Laboratory
LAWR02	University of California-LLNL
LEPD99	National Institute for Physics and Nuclear Engineering
LOCK01	Lockheed Analytical Chemistry - ICPP
LOCK03	Radiation Measurements Laboratory
LPTO99	SPA Typhoon, Obninsk, Russia
MART01	Lockheed Martin Utility Services
MART02	Lockheed Martin Utility Services Inc.
MART03	Radioactive Materials Analysis Laboratory
MDPH01	MDPH-Radiation Control Program
MOUN01	Mountain States Analytical, Inc.
NARL01	National Air and Radiation Environmental Laboratory
NESI01	B&W NESI - Nuclear Environmental Laboratory
NMLA01	Assaiggi Analytical Laboratories
NRLL99	National Radiation Laboratory, Christchurch, New Zealand
OBGL01	O'Brien & Gere Laboratories, Inc.
ORIS01	ORISE/ESSAP
OTLI01	Outreach Technologies Laboratory, Inc.
PRAP01	IT WPRAP Laboratory

MAPEP-02-S9 Reporting Participants (cont.)

Lab Code	Laboratory Name
QUAN01	Quanterra Incorporated
QUAN02	Quanterra Incorporated, Knoxville Laboratory
QUAN03	Quanterra Environmental Services
RECC01	Environmental Chemical Corp.
ROCK01	Kaiser-Hill Co., Inc.
RSIR99	Instituto de Radioprotecao e Dosimetria, Rio de Janeiro
SAVA01	Savannah River Technology Center/ ADS.
SCAL01	Sanford Cohen and Associates
SNEC01	Saxton Nuclear Experimental Corp.
SOUT01	Southwest Research Institute
SWOL01	Southwest Laboratory of Oklahoma
TELE01	Teledyne Brown Engineering - Environmental Services
TELE02	Teledyne Isotopes Midwest Lab
TMAE01	Thermo Nutech
TMAO01	Thermo Nutech
TMAR01	Thermo Nutech
TNUT01	Thermo-Nutech
UPVL99	Universidad Politecnica de Valencia, Valencia, Spain
WEST01	R.F. Weston
WEST03	Waste Sampling and Characterization Facility
WEST04	Westinghouse Electric Corporation
YAEC01	Yankee Atomic Electric Company

MAPEP-02-S9 Non-Reporting Participants

Lab Code	Laboratory Name
ADEM01	Alabama Department of Environmental Management
AK2501	Lockheed Martin Energy Systems, K-25 Site, ASO
CNEA99	Comision Nacional de Energia Atomica, Asuncion, Paraguay
FERM01	FERMCO
IPEN99	Instituto Peruano de Energia Nuclear, Lima, Peru
NFSI01	Nuclear Fuel Services, Inc.
RSAL01	RSA Laboratories
UINP99	University of Istanbul/Nuclear Physics, Istanbul, Turkey

Changes in Laboratory Status

<i>Lab Code</i>	<i>Laboratory Name</i>
CORE01	Laboratory closed – samples returned
INST99	Banned by Dept. of Commerce – EAR
RCCI99	Banned by Dept. of Commerce – EAR
NMTL01	Nuclear Materials Technology, Los Alamos National Laboratory All sample distributions on hold until further notice

Other MAPEP Participants

<i>Lab Code</i>	<i>Laboratory Name</i>
CIRP99	LOW BACKGROUND RADIOACTIVITY LABORATORY – water only
ERHD99	Fallout and Reactors Section, Ottawa, Canada – water only
IDGR01	Internal Dosimetry Group-Rad. Lab. – water only
IEMA99	Analytical Ecotoxicology Severtzov Institute of Ecology Russia – water only
WRRI99	Water Resources Research Center – water only

APPENDIX

B

Analytical Data

Mixed Analyte Performance Evaluation Program

Statistical Summary

Sample ID: MAPEP-02-S9

Analyte	T(1)	A(2)	Grand Mean	Std. Dev.	Reference Value	Analyte Text	Acceptance Limits	Units
Arsenic	32	32	69.39	6.18	70		49.00 - 91.00	(mg/kg)
Barium	33	31	293.42	22.16	300		210.00 - 390.00	(mg/kg)
Beryllium	18	18				False Positive Test		(mg/kg)
Cadmium	34	32	16.86	1.64	17.3		12.11 - 22.49	(mg/kg)
Chromium	34	34	74.90	7.74	76		53.20 - 98.80	(mg/kg)
Lead	34	32	35.84	4.30	38.1		26.67 - 49.53	(mg/kg)
Nickel	33	31	23.52	2.28	24		16.80 - 31.20	(mg/kg)
Selenium	29	24	17.74	2.27	18.5		12.95 - 24.05	(mg/kg)
Silver	30	27	52.81	2.83	55.5		38.85 - 72.15	(mg/kg)
Thallium	30	26	45.95	5.10	46.3		32.41 - 60.19	(mg/kg)
Uranium-Total	3	3			18.5		12.95 - 24.05	
Uranium-235	1	1			0.13		0.09 - 0.17	
Uranium-238	1	1			18.4		12.88 - 23.92	
Vanadium	32	29	53.01	7.12	53.9		37.73 - 70.07	(mg/kg)
Zinc	33	30	72.26	7.62	74.5		52.15 - 96.85	(mg/kg)
Americium-241	38	35	43.19	4.21	43.5		30.45 - 56.55	(Bq/kg)
Cesium-134	50	48	803.98	78.44	862		603.40 - 1120.60	(Bq/kg)
Cesium-137	50	49	110.99	10.32	111		77.70 - 144.30	(Bq/kg)
Cobalt-57	48	46	250.21	28.42	246		172.20 - 319.80	(Bq/kg)
Cobalt-60	48	46	93.96	7.66	87.5		61.25 - 113.75	(Bq/kg)
Iron-55	4	3	1885.92	226.56	1870		1309.00 - 2431.00	(Bq/kg)
Manganese-54	49	48	580.94	50.58	546		382.20 - 709.80	(Bq/kg)
Nickel-63	12	12	1114.56	147.08	1180		826.00 - 1534.00	(Bq/kg)
Plutonium-238	37	36	32.99	3.23	33.3		23.31 - 43.29	(Bq/kg)
Plutonium-239/240	39	38	68.83	5.15	72.9		51.03 - 94.77	(Bq/kg)
Potassium-40	44	43	650.22	56.26	652		456.40 - 847.60	(Bq/kg)
Strontium-90	24	20				False Positive Test		
Uranium-234/233	34	33	208.21	16.14	229		160.30 - 297.70	(Bq/kg)
Uranium-235		5						(Bq/kg)
Uranium-238	37	36	210.21	18.53	220		154.00 - 286.00	(Bq/kg)
Zinc-65	48	46	881.33	76.08	809		566.30 - 1051.70	(Bq/kg)
Cumene	10	10	266.63	262.90	236.8		QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	13	13	404.43	409.82	214.2		QL - 975.47	(ug/kg)

Note:

Outliers are excluded from the statistical summary.

Outliers are defied as laboratory data with a bias greater than 30 percent.

(1) T = Total Number of Laboratories Reporting Analyte.

(2) A = Number of Laboratories with 'Acceptable' Performance.

1. For organic components with absolute value of Z-score < 3

2. Acceptance range minimum labeled as "QL" means from the Quantitation Limit to the upper range.

Analyte	T(1)	A(2)	Grand Mean	Std. Dev.	Reference Value	Analyte Text	Acceptance Limits	Units
Trichloroethene	11	11	41.92	43.93	26.6		QL - 95.57	(ug/kg)
t-butylbenzene	13	13	381.65	441.24	107.4		QL - 415.31	(ug/kg)
Toluene	13	13	33.56	30.50	18.3		QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	15	15	62.41	22.50	64.8		QL - 133.51	(ug/kg)
Tetrachloroethene	15	15	117.35	74.77	114.2		QL - 356.01	(ug/kg)
n-butylbenzene	13	13	469.03	630.25	78.6		QL - 299.81	(ug/kg)
Ethylbenzene	15	15	135.36	88.25	130.3		QL - 420.60	(ug/kg)
m & p-Xylene	15	15	160.55	108.39	153.7		QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	15	15	949.47	441.23	972		QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	16	16	251.17	96.25	251.2		QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	17	17	266.45	92.68	266.4		QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	19	19	354.57	106.93	354.6		33.88 - 675.26	(ug/kg)
Naphthalene	19	19	398.46	117.62	398.4		45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	9	9	166.97	59.13	167		QL - 344.31	(ug/kg)
2-Chloronaphthalene	20	20	386.76	86.56	386.8		127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	21	21	436.43	132.39	436.4		39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	21	21	431.90	123.64	431.9		61.10 - 802.70	(ug/kg)
Diethylphthalate	20	20	459.65	115.66	459.6		112.77 - 806.53	(ug/kg)
Hexachlorobenzene	21	21	369.94	102.04	369.9		63.91 - 675.97	(ug/kg)
Phenanthrene	21	21	494.42	133.07	494.4		95.33 - 893.50	(ug/kg)
Anthracene	21	21	382.71	112.40	382.7		45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	5	5	290.50	102.10	290.5		QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	7	7	311.94	125.50	311.9		QL - 688.44	(ug/kg)
Pentachlorobenzene	11	11	363.96	133.51	364		QL - 764.35	(ug/kg)
Pyrene	21	21	465.02	157.65	465		QL - 937.81	(ug/kg)
Benzo(a)anthracene	21	21	464.05	161.37	464		QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	20	20	2957.02	1250.23	2957		QL - 6706.45	(ug/kg)

Note:

Outliers are excluded from the statistical summary.

Outliers are defied as laboratory data with a bias greater than 30 percent.

(1) T = Total Number of Laboratories Reporting Analyte.

(2) A = Number of Laboratories with 'Acceptable' Performance.

1. For organic components with absolute value of Z-score < 3

2. Acceptance range minimum labeled as "QL" means from the Quantitation Limit to the upper range.

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Argonne National Laboratory/Analytical Chemistry Lab.
ANLA01 9700 S. Cass Avenue

Argonne IL 60439

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	74.1	70	A		5.9	49.00 - 91.00			(mg/kg)
Barium	323	300	A		7.7	210.00 - 390.00			(mg/kg)
Beryllium	NR								
Cadmium	19.4	17.3	A		12.1	12.11 - 22.49			(mg/kg)
Chromium	87.2	76	A		14.7	53.20 - 98.80			(mg/kg)
Lead	36.4	38.1	A		-4.5	26.67 - 49.53			(mg/kg)
Nickel	24.4	24	A		1.7	16.80 - 31.20			(mg/kg)
Selenium	16.6	18.5	A		-10.3	12.95 - 24.05			(mg/kg)
Silver	48.8	55.5	A		-12.1	38.85 - 72.15			(mg/kg)
Thallium	54.2	46.3	A		17.1	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	70.2	53.9	N		30.2	37.73 - 70.07			(mg/kg)
Zinc	74.6	74.5	A		0.1	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	855	862	A		-0.8	603.40 - 1120.60	30		(Bq/kg)
Cesium-137	96	111	A		-13.5	77.70 - 144.30	1	L	(Bq/kg)
Cobalt-57	123	246	N		-50.0	172.20 - 319.80	6		(Bq/kg)
Cobalt-60	87	87.5	A		-0.6	61.25 - 113.75	2	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	512	546	A		-6.2	382.20 - 709.80	3	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	637	652	A		-2.3	456.40 - 847.60	20		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	811	809	A		0.2	566.30 - 1051.70	6	L	(Bq/kg)

Flags:

A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Argonne National Laboratory/Analytical Chemistry Lab.
ANLA01
 9700 S. Cass Avenue

Argonne IL 60439

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	252	251.2	A		0.0	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	284	266.4	A		0.2	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	425	354.6	A		0.7	33.88 - 675.26	(ug/kg)
Naphthalene	496	398.4	A		0.8	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	453	386.8	A		0.8	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	584	436.4	A		1.1	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	441	431.9	A		0.1	61.10 - 802.70	(ug/kg)
Diethylphthalate	533	459.6	A		0.6	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	467	369.9	A		1.0	63.91 - 675.97	(ug/kg)
Phenanthrene	654	494.4	A		1.2	95.33 - 893.50	(ug/kg)
Anthracene	276	382.7	A		-0.9	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	461	364	A		0.7	QL - 764.35	(ug/kg)
Pyrene	518	465	A		0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	434	464	A		-0.2	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2700	2957	A		-0.2	QL - 6706.45	(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Paragon Analytics, Inc.

ANTE01

225 Commerce Drive

Fort Collins

CO

80524

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	71.2	70	A		1.7	49.00 - 91.00			(mg/kg)
Barium	276	300	A		-8.0	210.00 - 390.00			(mg/kg)
Beryllium	NR								
Cadmium	16.7	17.3	A		-3.5	12.11 - 22.49			(mg/kg)
Chromium	69.1	76	A		-9.1	53.20 - 98.80			(mg/kg)
Lead	36.0	38.1	A		-5.5	26.67 - 49.53			(mg/kg)
Nickel	21.9	24	A		-8.8	16.80 - 31.20			(mg/kg)
Selenium	19.2	18.5	A		3.8	12.95 - 24.05			(mg/kg)
Silver	55.6	55.5	A		0.2	38.85 - 72.15			(mg/kg)
Thallium	45.0	46.3	A		-2.8	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	46.6	53.9	A		-13.5	37.73 - 70.07			(mg/kg)
Zinc	63.9	74.5	A		-14.2	52.15 - 96.85			(mg/kg)
Americium-241	42.3	43.5	A		-2.8	30.45 - 56.55	2.86		(Bq/kg)
Cesium-134	771	862	A		-10.6	603.40 - 1120.60	63.6		(Bq/kg)
Cesium-137	107	111	A		-3.6	77.70 - 144.30	8.98		(Bq/kg)
Cobalt-57	236	246	A		-4.1	172.20 - 319.80	19.5		(Bq/kg)
Cobalt-60	89.8	87.5	A		2.6	61.25 - 113.75	7.48		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	559	546	A		2.4	382.20 - 709.80	46.3		(Bq/kg)
Nickel-63	1125	1180	A		-4.7	826.00 - 1534.00	82.6		(Bq/kg)
Plutonium-238	33.8	33.3	A		1.5	23.31 - 43.29	2.50		(Bq/kg)
Plutonium-239/240	69.6	72.9	A		-4.5	51.03 - 94.77	4.77		(Bq/kg)
Potassium-40	595	652	A		-8.7	456.40 - 847.60	51.1		(Bq/kg)
Strontium-90	2.02		A				1.10		(Bq/kg)
Uranium-234/233	212	229	A		-7.4	160.30 - 297.70	13.4		(Bq/kg)
Uranium-235	31.6						4.63		(Bq/kg)
Uranium-238	221	220	A		0.5	154.00 - 286.00	14.0		(Bq/kg)
Zinc-65	872	809	A		7.8	566.30 - 1051.70	72.3		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for infomation purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Paragon Analytics, Inc.
ANTE01
 225 Commerce Drive
 Fort Collins CO 80524

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	311	251.2	A		0.6	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	297	266.4	A		0.3	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	370	354.6	A		0.1	33.88 - 675.26	(ug/kg)
Naphthalene	431	398.4	A		0.3	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	452	386.8	A		0.8	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	547	436.4	A		0.8	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	547	431.9	A		0.9	61.10 - 802.70	(ug/kg)
Diethylphthalate	502	459.6	A		0.4	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	475	369.9	A		1.0	63.91 - 675.97	(ug/kg)
Phenanthrene	598	494.4	A		0.8	95.33 - 893.50	(ug/kg)
Anthracene	512	382.7	A		1.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	587	465	A		0.8	QL - 937.81	(ug/kg)
Benzo(a)anthracene	558	464	A		0.6	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3285	2957	A		0.3	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Argonne National Laboratory West

ARGO01 EBRII-Site

Idaho Falls ID 83403

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	74.8	70	A		6.9	49.00 - 91.00	7.5		(mg/kg)
Barium	342.6	300	A		14.2	210.00 - 390.00	34		(mg/kg)
Beryllium	NR								
Cadmium	17.57	17.3	A		1.6	12.11 - 22.49	1.8		(mg/kg)
Chromium	87.53	76	A		15.2	53.20 - 98.80	8.8		(mg/kg)
Lead	39.5	38.1	A		3.7	26.67 - 49.53	4.0		(mg/kg)
Nickel	26.98	24	A		12.4	16.80 - 31.20	2.7		(mg/kg)
Selenium	18.59	18.5	A		0.5	12.95 - 24.05	1.9		(mg/kg)
Silver	55.03	55.5	A		-0.8	38.85 - 72.15	5.5		(mg/kg)
Thallium	47.37	46.3	A		2.3	32.41 - 60.19	4.7		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Argonne National Laboratory West

ARGO01 EBRII-Site

Idaho Falls ID 83403

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags: A = Result acceptable Z-score <=2.0)

W = Result acceptable with warning 2.0 < Z-score <=3.0)

N = Result not acceptable Z-score > 3.0)

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

American Radiation Services Inc.
ARSL01 1726 Wooddale Court

Baton Rouge LA 70806

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	41.8054	43.5	A		-3.9	30.45 - 56.55	1.2332	L	(Bq/kg)
Cesium-134	710.0752	862	A		-17.6	603.40 - 1120.60	2.3938	L	(Bq/kg)
Cesium-137	104.0819	111	A		-6.2	77.70 - 144.30	1.2949	L	(Bq/kg)
Cobalt-57	232.1988	246	A		-5.6	172.20 - 319.80	1.1283	L	(Bq/kg)
Cobalt-60	89.7768	87.5	A		2.6	61.25 - 113.75	0.8633	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	537.2426	546	A		-1.6	382.20 - 709.80	3.3296	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	38.0688	33.3	A		14.3	23.31 - 43.29	2.9223		(Bq/kg)
Plutonium-239/240	69.3180	72.9	A		-4.9	51.03 - 94.77	3.9238		(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	208.6493	229	A		-8.9	160.30 - 297.70	6.6518		(Bq/kg)
Uranium-238	203.6626	220	A		-7.4	154.00 - 286.00	6.2407		(Bq/kg)
Zinc-65	848.07	809	A		4.8	566.30 - 1051.70	6.1659	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

American Radiation Services Inc.
ARSL01 1726 Wooddale Court

Baton Rouge LA 70806

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LMES ACO Y-12 Building 9995 Laboratory
AY1201 Y12, Building 9995, Rm 142

Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	68.0	70	A		-2.9	49.00 - 91.00			(mg/kg)
Barium	293	300	A		-2.3	210.00 - 390.00			(mg/kg)
Beryllium	0.931		A						(mg/kg)
Cadmium	16.1	17.3	A		-6.9	12.11 - 22.49			(mg/kg)
Chromium	77.7	76	A		2.2	53.20 - 98.80			(mg/kg)
Lead	36.1	38.1	A		-5.2	26.67 - 49.53			(mg/kg)
Nickel	22.8	24	A		-5.0	16.80 - 31.20			(mg/kg)
Selenium	17.0	18.5	A		-8.1	12.95 - 24.05			(mg/kg)
Silver	53.0	55.5	A		-4.5	38.85 - 72.15			(mg/kg)
Thallium	48.4	46.3	A		4.5	32.41 - 60.19			(mg/kg)
Uranium-Total	17.2	18.5	A		-7.0	12.95 - 24.05			(mg/kg)
Uranium-235	0.122	0.13	A		-6.2	0.09 - 0.17			(mg/kg)
Uranium-238	17.08	18.4	A		-7.2	12.88 - 23.92			(mg/kg)
Vanadium	59.8	53.9	A		10.9	37.73 - 70.07			(mg/kg)
Zinc	75.6	74.5	A		1.5	52.15 - 96.85			(mg/kg)
Americium-241	30.34	43.5	N		-30.3	30.45 - 56.55	5		(Bq/kg)
Cesium-134	690.79	862	A		-19.9	603.40 - 1120.60	18.9	L	(Bq/kg)
Cesium-137	100.62	111	A		-9.4	77.70 - 144.30	5.7		(Bq/kg)
Cobalt-57	218.32	246	A		-11.3	172.20 - 319.80	9.8		(Bq/kg)
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	536.62	546	A		-1.7	382.20 - 709.80	28.5		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	44.79	33.3	N		34.5	23.31 - 43.29	5.7		(Bq/kg)
Plutonium-239/240	64.86	72.9	A		-11.0	51.03 - 94.77	6.6		(Bq/kg)
Potassium-40	592.12	652	A		-9.2	456.40 - 847.60	37.2		(Bq/kg)
Strontium-90	15.8		A				37		(Bq/kg)
Uranium-234/233	201	229	A		-12.2	160.30 - 297.70	39		(Bq/kg)
Uranium-238	188	220	A		-14.5	154.00 - 286.00	36		(Bq/kg)
Zinc-65	827.69	809	A		2.3	566.30 - 1051.70	44.1		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

AY1201 LMES ACO Y-12 Building 9995 Laboratory
Y12, Building 9995, Rm 142

Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	45	236.8	A		-0.7	QL - 1017.70	(ug/kg)
1,1-Dichloroethane	<25						(ug/kg)
Methylene Chloride	45						(ug/kg)
1,2,4-Trimethylbenzene	76	214.2	A		-0.5	QL - 975.47	(ug/kg)
Chloroform	<25			4.6			(ug/kg)
1,1,1-Trichloroethane	<25						(ug/kg)
Carbon Tetrachloride	<25						(ug/kg)
Benzene	<25						(ug/kg)
1,2-Dichloroethane	<25						(ug/kg)
Trichloroethene	84	26.6	W		2.5	QL - 95.57	(ug/kg)
1,2-Dichloropropane	<25						(ug/kg)
Bromodichloromethane	<25						(ug/kg)
t-butylbenzene	49	107.4	A		-0.6	QL - 415.31	(ug/kg)
cis-1,3-Dichloropropene	<25						(ug/kg)
Toluene	45	18.3	A		1.8	QL - 61.94	(ug/kg)
trans-1,3-Dichloropropene	<25						(ug/kg)
1,1,2-Trichloroethane	58	64.8	A		-0.3	QL - 133.51	(ug/kg)
1,3-Dichloropropane	<25						(ug/kg)
Tetrachloroethene	51	114.2	A		-0.8	QL - 356.01	(ug/kg)
n-butylbenzene	25	78.6	A		-0.7	QL - 299.81	(ug/kg)
Ethylbenzene	52	130.3	A		-0.8	QL - 420.60	(ug/kg)
m & p-Xylene	71	153.7	A		-0.7	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	544	972	A		-0.8	QL - 2497.60	(ug/kg)
o-Xylene	<25						(ug/kg)
Analine	330						(ug/kg)
Phenol	<330						(ug/kg)
2-Chlorophenol	<330						(ug/kg)
1,3-Dichlorobenzene	400	251.2	A		1.5	QL - 539.81	(ug/kg)
1,4-Dichlorobenzene	<330						(ug/kg)
Benzyl Alcohol	<330						(ug/kg)
1,2-Dichlorobenzene	390	266.4	A		1.3	QL - 544.41	(ug/kg)
Hexachloroethane	<330						(ug/kg)
Nitrobenzene	<330						(ug/kg)
Isophorone	<330						(ug/kg)
2-Nitrophenol	<330						(ug/kg)
2,4-Dimethylphenol	<330						(ug/kg)
2,4-Dichlorophenol	<670						(ug/kg)
1,2,4-Trichlorobenzene	470	354.6	A		1.1	33.88 - 675.26	(ug/kg)
Naphthalene	550	398.4	A		1.3	45.71 - 751.21	(ug/kg)
Hexachlorobutadiene	<330						(ug/kg)
4-Chloro-3-methylphenol	<670						(ug/kg)
2-Methylnaphthalene	<330						(ug/kg)
2-Methylphenol	<670						(ug/kg)
Hexachlorocyclopentadiene	<330						(ug/kg)
3 Methyl & 4-Methylphenol	<670						(ug/kg)
2,4,6-Trichlorophenol	<330						(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
o-Toluidine	<330						(ug/kg)
2-Chloronaphthalene	380	386.8	A		-0.1	127.18 - 646.34	(ug/kg)
2-Nitroaniline	<330						(ug/kg)
Dimethylphthalate	<330						(ug/kg)

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

AY1201	LMES ACO Y-12 Building 9995 Laboratory					
	Y12, Building 9995, Rm 142					
	Oak Ridge	TN	37831			
Acenaphthylene	<330					(ug/kg)
2,6-Dinitrotoluene	500	436.4	A	0.5	39.41 - 833.45	(ug/kg)
3-Nitroanaline	<330					(ug/kg)
Acenaphthene	<330					(ug/kg)
2,4-Dinitrotoluene	550	431.9	A	1.0	61.10 - 802.70	(ug/kg)
2,4-Dinitrophenol	<1700					(ug/kg)
4-Chloroanaline	<330					(ug/kg)
Dibenzofuran	<330					(ug/kg)
4-Nitrophenol	<670					(ug/kg)
2-Naphthylamine	<330					(ug/kg)
Fluorene	<330					(ug/kg)
Diethylphthalate	580	459.6	A	1.0	112.77 - 806.53	(ug/kg)
4,6-Dinitro-2-methylpheno	<670					(ug/kg)
1,2,4,5-Tetrachlorobenzene	<330					(ug/kg)
2,4,5-Trichlorophenol	<330					(ug/kg)
Hexachlorobenzene	410	369.9	A	0.4	63.91 - 675.97	(ug/kg)
Pentachlorophenol	<670					(ug/kg)
4-Nitroanaline	<330					(ug/kg)
Phenanthrene	640	494.4	A	1.1	95.33 - 893.50	(ug/kg)
Anthracene	570	382.7	A	1.7	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	440	290.5	A	1.5	QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	460	311.9	A	1.2	QL - 688.44	(ug/kg)
Pentachlorobenzene	530	364	A	1.2	QL - 764.35	(ug/kg)
Pentachloronitrobenzene	<330					(ug/kg)
Di-n-butylphthalate	<330					(ug/kg)
2,3,4,6-Tetrachlorophenol	<330					(ug/kg)
Fluoranthene	<330					(ug/kg)
Pyrene	640	465	A	1.1	QL - 937.81	(ug/kg)
Butylbenzylphthalate	<330					(ug/kg)
Benzo(a)anthracene	640	464	A	1.1	QL - 948.00	(ug/kg)
Chrysene	<330					(ug/kg)
Bis(2-ethylhexyl)phthalate	3900	2957	A	0.8	QL - 6706.45	(ug/kg)
Di-n-octylphthalate	<330					(ug/kg)
Benzo(b)fluoranthene	<330					(ug/kg)
Benzo(k)fluoranthene	<330					(ug/kg)
Benzo(a)pyrene	<330					(ug/kg)
Indeno(1,2,3-c,d)pyrene	<330					(ug/kg)
Dibenzo(a,h)anthracene	<670					(ug/kg)
Benzo(g,h,i)perylene	<330					(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Northeast Laboratory Services, Inc.
BNEL01 PO Box 788

Waterville ME 04903

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	70.3	70	A		0.4	49.00 - 91.00			(mg/kg)
Barium	NR	300				210.00 - 390.00			
Beryllium	<10		A						(mg/kg)
Cadmium	17.7	17.3	A		2.3	12.11 - 22.49			(mg/kg)
Chromium	72.3	76	A		-4.9	53.20 - 98.80			(mg/kg)
Lead	53.9	38.1	N		41.5	26.67 - 49.53			(mg/kg)
Nickel	23.1	24	A		-3.8	16.80 - 31.20			(mg/kg)
Selenium	23.1	18.5	W		24.9	12.95 - 24.05			(mg/kg)
Silver	<10	55.5	N	False Negative		38.85 - 72.15			(mg/kg)
Thallium	35.4	46.3	W		-23.5	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	39.6	53.9	W		-26.5	37.73 - 70.07			(mg/kg)
Zinc	70.2	74.5	A		-5.8	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Northeast Laboratory Services, Inc.
BNEL01 PO Box 788
 Waterville ME 04903

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	1050	214.2	W		3.3	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	1060	107.4	W		9.3	QL - 415.31	(ug/kg)
Toluene	88.5	18.3	W		4.8	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	86.0	64.8	A		0.9	QL - 133.51	(ug/kg)
Tetrachloroethene	238	114.2	A		1.5	QL - 356.01	(ug/kg)
n-butylbenzene	1620	78.6	W		20.9	QL - 299.81	(ug/kg)
Ethylbenzene	284	130.3	A		1.6	QL - 420.60	(ug/kg)
m & p-Xylene	334	153.7	A		1.5	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1400	972	A		0.8	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	NR	251.2	N	False Negative		QL - 539.81	
1,4-Dichlorobenzene	274		N	False Positive			(ug/kg)
1,2-Dichlorobenzene	298	266.4	A		0.3	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	378	354.6	A		0.2	33.88 - 675.26	(ug/kg)
Naphthalene	468	398.4	A		0.6	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	428	386.8	A		0.5	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	521	436.4	A		0.6	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	606	431.9	A		1.4	61.10 - 802.70	(ug/kg)
Diethylphthalate	484	459.6	A		0.2	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	399	369.9	A		0.3	63.91 - 675.97	(ug/kg)
Phenanthrene	568	494.4	A		0.6	95.33 - 893.50	(ug/kg)
Anthracene	441	382.7	A		0.5	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	614	465	A		0.9	QL - 937.81	(ug/kg)
Benzo(a)anthracene	777	464	A		1.9	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	4170	2957	A		1.0	QL - 6706.45	(ug/kg)

- Flags:** A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

CCEN99 Comisión Chilena de Energía Nuclear-LAAN
AMUNATEGUI 95

SANTIAGO SANTIA 65006

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	76.7	72.1	A	Total Metal	6.4	50.47 - 93.73	6.1		(mg/kg)
Barium	966	861	A	Total Metal	12.2	602.70 - 1119.30	94		(mg/kg)
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	118.6	125	A	Total Metal	-5.1	87.50 - 162.50	12		(mg/kg)
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	9.6	18.5	N		-48.1	12.95 - 24.05	1.0		(mg/kg)
Silver	53.2	55.5	A		-4.1	38.85 - 72.15	5.1		(mg/kg)
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	114.5	110	A	Total Metal	4.1	77.00 - 143.00	9.6		(mg/kg)
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

CCEN99 Comisión Chilena de Energía Nuclear-LAAN
AMUNATEGUI 95

SANTIAGO SANTIA 65006

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

CDHS01 California Department of Health Services
Sanitation & Radiation Lab.

Berkeley CA 94704

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	45.86	43.5	A		5.4	30.45 - 56.55	4.35		(Bq/kg)
Cesium-134	886.09	862	A		2.8	603.40 - 1120.60	4.95	L	(Bq/kg)
Cesium-137	110.80	111	A		-0.2	77.70 - 144.30	2.51	L	(Bq/kg)
Cobalt-57	258.65	246	A		5.1	172.20 - 319.80	3.19	L	(Bq/kg)
Cobalt-60	94.92	87.5	A		8.5	61.25 - 113.75	2.11	L	(Bq/kg)
Iron-55	1912.75	1870	A		2.3	1309.00 - 2431.00	95.28		(Bq/kg)
Manganese-54	592.06	546	A		8.4	382.20 - 709.80	5.42	L	(Bq/kg)
Nickel-63	1332.62	1180	A		12.9	826.00 - 1534.00	35.52	L	(Bq/kg)
Plutonium-238	34.19	33.3	A		2.7	23.31 - 43.29	3.42		(Bq/kg)
Plutonium-239/240	71.87	72.9	A		-1.4	51.03 - 94.77	6.14		(Bq/kg)
Potassium-40	674.82	652	A		3.5	456.40 - 847.60	17.39	L	(Bq/kg)
Strontium-90	3.61		A				7.61		(Bq/kg)
Uranium-234/233	199.60	229	A		-12.8	160.30 - 297.70	13.11		(Bq/kg)
Uranium-238	206.29	220	A		-6.2	154.00 - 286.00	13.50		(Bq/kg)
Zinc-65	907.12	809	A		12.1	566.30 - 1051.70	10.74	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

California Department of Health Services
CDHS01 Sanitation & Radiation Lab.

Berkeley CA 94704

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Comision Ecuatoriana de Energia Atomica/U.Q.A.
CEEA99 JUAN LARREA 534 Y RIOFRIO

QUITO Pichinch 1

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	187.72	300	N		-37.4	210.00 - 390.00	19.667		(mg/kg)
Beryllium	NR								
Cadmium	15.75	17.3	A		-9.0	12.11 - 22.49	1.587		(mg/kg)
Chromium	62.98	76	A		-17.1	53.20 - 98.80	2.310		(mg/kg)
Lead	33.54	38.1	A		-12.0	26.67 - 49.53	1.201		(mg/kg)
Nickel	27.68	24	A		15.3	16.80 - 31.20	1.238		(mg/kg)
Selenium	NR	18.5				12.95 - 24.05			
Silver	47.53	55.5	A		-14.4	38.85 - 72.15	4.950		(mg/kg)
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	56.86	53.9	A		5.5	37.73 - 70.07	5.372		(mg/kg)
Zinc	79.05	74.5	A		6.1	52.15 - 96.85	0.673	L	(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Comision Ecuatoriana de Energia Atomica/U.Q.A.
CEEA99 JUAN LARREA 534 Y RIOFRIO

QUITO Pichinch 1

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

CESL01 Lawrence Livermore National Laboratory - CES
7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	1820.	862	N		111.1	603.40 - 1120.60	44.8	L	(Bq/kg)
Cesium-137	296.	111	N		166.7	77.70 - 144.30	18.1		(Bq/kg)
Cobalt-57	648.	246	N		163.4	172.20 - 319.80	29.		(Bq/kg)
Cobalt-60	241.	87.5	N		175.4	61.25 - 113.75	11.0		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	1560.	546	N		185.7	382.20 - 709.80	90.		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	34.1	33.3	A		2.4	23.31 - 43.29	1.59		(Bq/kg)
Plutonium-239/240	73.0	72.9	A		0.1	51.03 - 94.77	2.96		(Bq/kg)
Potassium-40	1700.	652	N		160.7	456.40 - 847.60	121.		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	191.	229	A		-16.6	160.30 - 297.70	5.35	L	(Bq/kg)
Uranium-238	196.	220	A		-10.9	154.00 - 286.00	5.49	L	(Bq/kg)
Zinc-65	2410.	809	N		197.9	566.30 - 1051.70	131.		(Bq/kg)

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 - H = Uncertainty potentially too high (for information purposes only)
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Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Lawrence Livermore National Laboratory - CES
CESL01
 7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
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- QL = Detection Limit
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Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

STL Denver
CORE02 4955 Yarrow St

Arvada CO 80002

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	67.8	70	A		-3.1	49.00 - 91.00			(mg/kg)
Barium	312	300	A		4.0	210.00 - 390.00			(mg/kg)
Beryllium	<10		A						(mg/kg)
Cadmium	15.7	17.3	A		-9.2	12.11 - 22.49			(mg/kg)
Chromium	75.8	76	A		-0.3	53.20 - 98.80			(mg/kg)
Lead	36.7	38.1	A		-3.7	26.67 - 49.53			(mg/kg)
Nickel	24.2	24	A		0.8	16.80 - 31.20			(mg/kg)
Selenium	17.9	18.5	A		-3.2	12.95 - 24.05			(mg/kg)
Silver	52.8	55.5	A		-4.9	38.85 - 72.15			(mg/kg)
Thallium	43.7	46.3	A		-5.6	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	59.2	53.9	A		9.8	37.73 - 70.07			(mg/kg)
Zinc	73.7	74.5	A		-1.1	52.15 - 96.85			(mg/kg)
Americium-241	44.9	43.5	A		3.2	30.45 - 56.55	5.0		(Bq/kg)
Cesium-134	819	862	A		-5.0	603.40 - 1120.60	21	L	(Bq/kg)
Cesium-137	113	111	A		1.8	77.70 - 144.30	3	L	(Bq/kg)
Cobalt-57	295	246	A		19.9	172.20 - 319.80	10		(Bq/kg)
Cobalt-60	95	87.5	A		8.6	61.25 - 113.75	2	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	591	546	A		8.2	382.20 - 709.80	14	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	27.0	33.3	A		-18.9	23.31 - 43.29	1.3		(Bq/kg)
Plutonium-239/240	52.7	72.9	W		-27.7	51.03 - 94.77	1.3	L	(Bq/kg)
Potassium-40	652	652	A		0.0	456.40 - 847.60	15	L	(Bq/kg)
Strontium-90	25.4		A				10.5		(Bq/kg)
Uranium-234/233	216	229	A		-5.7	160.30 - 297.70	5	L	(Bq/kg)
Uranium-235	9.5						1.2		(Bq/kg)
Uranium-238	219	220	A		-0.5	154.00 - 286.00	5	L	(Bq/kg)
Zinc-65	885	809	A		9.4	566.30 - 1051.70	17	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
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Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

STL Denver
CORE02 4955 Yarrow St

Arvada CO 80002

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	620	236.8	A		1.5	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	990	214.2	W		3.1	QL - 975.47	(ug/kg)
Chloroform	<10.0		4.6				(ug/kg)
1,2-Dichloroethane	<5.0						(ug/kg)
Trichloroethene	38.0	26.6	A		0.5	QL - 95.57	(ug/kg)
t-butylbenzene	970	107.4	W		8.4	QL - 415.31	(ug/kg)
Toluene	68.0	18.3	W		3.4	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	87.0	64.8	A		1.0	QL - 133.51	(ug/kg)
Tetrachloroethene	130	114.2	A		0.2	QL - 356.01	(ug/kg)
n-butylbenzene	1200	78.6	W		15.2	QL - 299.81	(ug/kg)
Ethylbenzene	150	130.3	A		0.2	QL - 420.60	(ug/kg)
m & p-Xylene	170	153.7	A		0.1	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1300	972	A		0.6	QL - 2497.60	(ug/kg)
Phenol	<330						(ug/kg)
2-Chlorophenol	<330						(ug/kg)
1,3-Dichlorobenzene	217	251.2	A		-0.4	QL - 539.81	(ug/kg)
1,4-Dichlorobenzene	<330						(ug/kg)
Benzyl Alcohol	<330						(ug/kg)
1,2-Dichlorobenzene	226	266.4	A		-0.4	QL - 544.41	(ug/kg)
Hexachloroethane	<330						(ug/kg)
Nitrobenzene	<330						(ug/kg)
Isophorone	<330						(ug/kg)
2-Nitrophenol	<330						(ug/kg)
2,4-Dimethylphenol	<330						(ug/kg)
2,4-Dichlorophenol	<330						(ug/kg)
1,2,4-Trichlorobenzene	267	354.6	A		-0.8	33.88 - 675.26	(ug/kg)
Naphthalene	297	398.4	A		-0.9	45.71 - 751.21	(ug/kg)
Hexachlorobutadiene	<330						(ug/kg)
4-Chloro-3-methylphenol	<330						(ug/kg)
2-Methylnaphthalene	<330						(ug/kg)
2-Methylphenol	<330						(ug/kg)
Hexachlorocyclopentadiene	<1600						(ug/kg)
3 Methyl & 4-Methylphenol	<330						(ug/kg)
2,4,6-Trichlorophenol	<330						(ug/kg)
2,6-Dichlorophenol	126	167	A		-0.7	QL - 344.31	(ug/kg)
o-Toluidine	<660						(ug/kg)
2-Chloronaphthalene	267	386.8	A		-1.4	127.18 - 646.34	(ug/kg)
2-Nitroaniline	<1600						(ug/kg)
Dimethylphthalate	<330						(ug/kg)
Acenaphthylene	<330						(ug/kg)
2,6-Dinitrotoluene	300	436.4	A		-1.0	39.41 - 833.45	(ug/kg)
3-Nitroaniline	<1600						(ug/kg)
Acenaphthene	<330						(ug/kg)
2,4-Dinitrotoluene	286	431.9	A		-1.2	61.10 - 802.70	(ug/kg)
2,4-Dinitrophenol	<1600						(ug/kg)
4-Chloroaniline	<330						(ug/kg)
Dibenzofuran	<330						(ug/kg)
4-Nitrophenol	<1600						(ug/kg)
2-Naphthylamine	<330						(ug/kg)
Fluorene	<330						(ug/kg)
Diethylphthalate	295	459.6	A		-1.4	112.77 - 806.53	(ug/kg)

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

CORE02	STL Denver					
	4955 Yarrow St					
	Arvada	CO	80002			
4,6-Dinitro-2-methylpheno	<1600					(ug/kg)
1,2,4,5-Tetrachlorobenzen	<330					(ug/kg)
2,4,5-Trichlorophenol	<330					(ug/kg)
Hexachlorobenzene	257	369.9	A	-1.1	63.91 - 675.97	(ug/kg)
Pentachlorophenol	<1600					(ug/kg)
4-Nitroanaline	<1600					(ug/kg)
Phenanthrene	307	494.4	A	-1.4	95.33 - 893.50	(ug/kg)
Anthracene	247	382.7	A	-1.2	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	207	290.5	A	-0.8	QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	208	311.9	A	-0.8	QL - 688.44	(ug/kg)
Pentachlorobenzene	252	364	A	-0.8	QL - 764.35	(ug/kg)
Pentachloronitrobenzene	<1600					(ug/kg)
Di-n-butylphthalate	<330					(ug/kg)
2,3,4,6-Tetrachlorophenol	<1600					(ug/kg)
Fluoranthene	<330					(ug/kg)
Pyrene	301	465	A	-1.0	QL - 937.81	(ug/kg)
Butylbenzylphthalate	<330					(ug/kg)
Benzo(a)anthracene	296	464	A	-1.0	QL - 948.00	(ug/kg)
Chrysene	<330					(ug/kg)
Bis(2-ethylhexyl)phthalat	2050	2957	A	-0.7	QL - 6706.45	(ug/kg)
Di-n-octylphthalate	<330					(ug/kg)
Benzo(b)fluoranthene	<330					(ug/kg)
Benzo(k)fluoranthene	<330					(ug/kg)
Benzo(a)pyrene	<330					(ug/kg)
Indeno(1,2,3-c,d)pyrene	<330					(ug/kg)
Dibenzo(a,h)anthracene	<330					(ug/kg)
Benzo(g,h,i)perylene	<330					(ug/kg)

- Flags:** A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LOS ALAMOS NATIONAL LABORATORY
CSTL01 BIKINI ATOLL ROAD MS K484
 LOS ALAMOS NM 87545

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	39.82	43.5	A		-8.5	30.45 - 56.55	1.32		(Bq/kg)
Cesium-134	916.00	862	A		6.3	603.40 - 1120.60	102.00		(Bq/kg)
Cesium-137	130.33	111	A		17.4	77.70 - 144.30	14.67		(Bq/kg)
Cobalt-57	289.33	246	A		17.6	172.20 - 319.80	32.33		(Bq/kg)
Cobalt-60	104.33	87.5	A		19.2	61.25 - 113.75	11.70		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	674.00	546	W		23.4	382.20 - 709.80	75.03		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	33.22	33.3	A		-0.2	23.31 - 43.29	1.61		(Bq/kg)
Plutonium-239/240	71.00	72.9	A		-2.6	51.03 - 94.77	1.67	L	(Bq/kg)
Potassium-40	739	652	A		13.3	456.40 - 847.60	84.17		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	1026.33	809	W		26.9	566.30 - 1051.70	114.33		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LOS ALAMOS NATIONAL LABORATORY
CSTL01 BIKINI ATOLL ROAD MS K484
 LOS ALAMOS NM 87545

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
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- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Departamento Ingeniería Nuclear
DINL99 alda de Urquijo s/n
 Bilbao Vizcaya 48013

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	3.70e+1	43.5	A		-14.9	30.45 - 56.55	1.54		(Bq/kg)
Cesium-134	8.09e+2	862	A		-6.1	603.40 - 1120.60	1.25e+1	L	(Bq/kg)
Cesium-137	1.06e+2	111	A		-4.5	77.70 - 144.30	1.84	L	(Bq/kg)
Cobalt-57	2.46e+2	246	A		0.0	172.20 - 319.80	4.27	L	(Bq/kg)
Cobalt-60	9.15e+1	87.5	A		4.6	61.25 - 113.75	1.59	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	5.13e+2	546	A		-6.0	382.20 - 709.80	8.89	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	3.21e+1	33.3	A		-3.6	23.31 - 43.29	1.29		(Bq/kg)
Plutonium-239/240	6.96e+1	72.9	A		-4.5	51.03 - 94.77	2.59		(Bq/kg)
Potassium-40	5.70e+2	652	A		-12.6	456.40 - 847.60	2.00e+1		(Bq/kg)
Strontium-90	0.555		N	False Positive			8.71e-2		(Bq/kg)
Uranium-234/233	2.36e+2	229	A		3.1	160.30 - 297.70	1.06e+1		(Bq/kg)
Uranium-235	1.43e+1						9.55e-1		(Bq/kg)
Uranium-238	2.44e+2	220	A		10.9	154.00 - 286.00	1.09	L	(Bq/kg)
Zinc-65	7.65e+2	809	A		-5.4	566.30 - 1051.70	1.43e+1	L	(Bq/kg)

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 QL = Detection Limit
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 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Departamento Ingeniería Nuclear
DINL99 alda de Urquijo s/n
 Bilbao Vizcaya 48013

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
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- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

EMBW01 BWXT of Ohio Inc., Mound, Environmental Monitoring
BWXT of Ohio, Inc.

Miamisburg OH 45343

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	39.81	33.3	A		19.5	23.31 - 43.29	4.22		(Bq/kg)
Plutonium-239/240	75.44	72.9	A		3.5	51.03 - 94.77	7.03		(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	237.39	229	A		3.7	160.30 - 297.70	18.02		(Bq/kg)
Uranium-238	231.14	220	A		5.1	154.00 - 286.00	17.58		(Bq/kg)
Zinc-65	NR	809				566.30 - 1051.70			

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 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

EMBW01 BWXT of Ohio Inc., Mound, Environmental Monitoring
BWXT of Ohio, Inc.

Miamisburg OH 45343

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
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- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

U. S. EPA Office of Radiation and Indoor Air
EPAL01 944 E. Harmon Ave.

Las Vegas NV 89119

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	30.9	33.3	A		-7.2	23.31 - 43.29	2.32		(Bq/kg)
Plutonium-239/240	62.2	72.9	A		-14.7	51.03 - 94.77	4.75		(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%
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Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

U. S. EPA Office of Radiation and Indoor Air
EPAL01 944 E. Harmon Ave.

Las Vegas NV 89119

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
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- QL = Detection Limit
- RW = Report Warning
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Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Public Health Laboratories
ERCL01 1610 N.E. 150 th Street

Shoreline WA 98155

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	61.9	70	A		-11.6	49.00 - 91.00	7.4		(mg/kg)
Barium	23.8	300	N		-92.1	210.00 - 390.00	1.2		(mg/kg)
Beryllium	1.17		A				0.06		(mg/kg)
Cadmium	17.8	17.3	A		2.9	12.11 - 22.49	0.3	L	(mg/kg)
Chromium	62.5	76	A		-17.8	53.20 - 98.80	0.60	L	(mg/kg)
Lead	37.2	38.1	A		-2.4	26.67 - 49.53	3.4		(mg/kg)
Nickel	16.5	24	N		-31.3	16.80 - 31.20	0.80		(mg/kg)
Selenium	8.59	18.5	N		-53.6	12.95 - 24.05	2.07	H	(mg/kg)
Silver	48.6	55.5	A		-12.4	38.85 - 72.15	0.2	L	(mg/kg)
Thallium	22.5	46.3	N		-51.4	32.41 - 60.19	1.5		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	30.1	53.9	N		-44.2	37.73 - 70.07	0.40	L	(mg/kg)
Zinc	43.3	74.5	N		-41.9	52.15 - 96.85	0.4	L	(mg/kg)
Americium-241	40.6	43.5	A		-6.7	30.45 - 56.55	1.4		(Bq/kg)
Cesium-134	781	862	A		-9.4	603.40 - 1120.60	10	L	(Bq/kg)
Cesium-137	111	111	A		0.0	77.70 - 144.30	3	L	(Bq/kg)
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	97.8	87.5	A		11.8	61.25 - 113.75	1.1	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	595	546	A		9.0	382.20 - 709.80	20		(Bq/kg)
Nickel-63	980	1180	A		-16.9	826.00 - 1534.00	98		(Bq/kg)
Plutonium-238	31.4	33.3	A		-5.7	23.31 - 43.29	2.3		(Bq/kg)
Plutonium-239/240	66.4	72.9	A		-8.9	51.03 - 94.77	4.4		(Bq/kg)
Potassium-40	667	652	A		2.3	456.40 - 847.60	16	L	(Bq/kg)
Strontium-90	0.48		A				0.52		(Bq/kg)
Uranium-234/233	218	229	A		-4.8	160.30 - 297.70	4	L	(Bq/kg)
Uranium-238	215	220	A		-2.3	154.00 - 286.00	4	L	(Bq/kg)
Zinc-65	914	809	A		13.0	566.30 - 1051.70	15	L	(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Public Health Laboratories
ERCL01 1610 N.E. 150 th Street
 Shoreline WA 98155

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RMI Environmental Services
ERMI01 1601 East 21st Street

Ashtabula OH 44004

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	287	300	A		-4.3	210.00 - 390.00	14		(mg/kg)
Beryllium	NR								
Cadmium	14.8	17.3	A		-14.5	12.11 - 22.49	0.4	L	(mg/kg)
Chromium	NR	76				53.20 - 98.80			
Lead	30.0	38.1	W		-21.3	26.67 - 49.53	1.5		(mg/kg)
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	63.5	74.5	A		-14.8	52.15 - 96.85	3.2		(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	846	862	A		-1.9	603.40 - 1120.60	13	L	(Bq/kg)
Cesium-137	125.3	111	A		12.9	77.70 - 144.30	3.6	L	(Bq/kg)
Cobalt-57	251	246	A		2.0	172.20 - 319.80	13		(Bq/kg)
Cobalt-60	100.5	87.5	A		14.9	61.25 - 113.75	2.6	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	635	546	A		16.3	382.20 - 709.80	15	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	711	652	A		9.0	456.40 - 847.60	18	L	(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	918	809	A		13.5	566.30 - 1051.70	17	L	(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RMI Environmental Services
ERMI01
 1601 East 21st Street

Ashtabula OH 44004

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

General Engineering Laboratories Inc.
GENE01
2040 Savage Road

Charleston SC 29417

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	73.8	70	A		5.4	49.00 - 91.00			(mg/kg)
Barium	316	300	A		5.3	210.00 - 390.00			(mg/kg)
Beryllium	1.05		A						(mg/kg)
Cadmium	17.0	17.3	A		-1.7	12.11 - 22.49			(mg/kg)
Chromium	83.5	76	A		9.9	53.20 - 98.80			(mg/kg)
Lead	35.7	38.1	A		-6.3	26.67 - 49.53			(mg/kg)
Nickel	24.2	24	A		0.8	16.80 - 31.20			(mg/kg)
Selenium	18.7	18.5	A		1.1	12.95 - 24.05			(mg/kg)
Silver	59.3	55.5	A		6.8	38.85 - 72.15			(mg/kg)
Thallium	48.2	46.3	A		4.1	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	62.0	53.9	A		15.0	37.73 - 70.07			(mg/kg)
Zinc	77.7	74.5	A		4.3	52.15 - 96.85			(mg/kg)
Americium-241	45.6	43.5	A		4.8	30.45 - 56.55	3.82		(Bq/kg)
Cesium-134	725.2	862	A		-15.9	603.40 - 1120.60	38.1		(Bq/kg)
Cesium-137	110.6	111	A		-0.4	77.70 - 144.30	6.05		(Bq/kg)
Cobalt-57	271.7	246	A		10.4	172.20 - 319.80	13.5		(Bq/kg)
Cobalt-60	91.4	87.5	A		4.5	61.25 - 113.75	4.87		(Bq/kg)
Iron-55	1596	1870	A		-14.6	1309.00 - 2431.00	67.1		(Bq/kg)
Manganese-54	584.6	546	A		7.1	382.20 - 709.80	37.7		(Bq/kg)
Nickel-63	1078	1180	A		-8.6	826.00 - 1534.00	15.9	L	(Bq/kg)
Plutonium-238	32.0	33.3	A		-3.9	23.31 - 43.29	2.97		(Bq/kg)
Plutonium-239/240	75.5	72.9	A		3.6	51.03 - 94.77	5.34		(Bq/kg)
Potassium-40	678.3	652	A		4.0	456.40 - 847.60	37.0		(Bq/kg)
Strontium-90	2.66		A				1.31		(Bq/kg)
Uranium-234/233	206.0	229	A		-10.0	160.30 - 297.70	13.1		(Bq/kg)
Uranium-238	217.2	220	A		-1.3	154.00 - 286.00	13.6		(Bq/kg)
Zinc-65	916.4	809	A		13.3	566.30 - 1051.70	53.6		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

General Engineering Laboratories Inc.
GENE01 2040 Savage Road

Charleston SC 29417

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	734	236.8	A		1.9	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	1110	214.2	W		3.5	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	1200	107.4	W		10.6	QL - 415.31	(ug/kg)
Toluene	93.3	18.3	W		5.2	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	86.7	64.8	A		1.0	QL - 133.51	(ug/kg)
Tetrachloroethene	252	114.2	A		1.7	QL - 356.01	(ug/kg)
n-butylbenzene	1590	78.6	W		20.5	QL - 299.81	(ug/kg)
Ethylbenzene	307	130.3	A		1.8	QL - 420.60	(ug/kg)
m & p-Xylene	374	153.7	A		1.9	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1380	972	A		0.8	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	106	251.2	A		-1.5	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	126	266.4	A		-1.5	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	181	354.6	A		-1.6	33.88 - 675.26	(ug/kg)
Naphthalene	207	398.4	A		-1.6	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	145	167	A		-0.4	QL - 344.31	(ug/kg)
2-Chloronaphthalene	201	386.8	W		-2.1	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	264	436.4	A		-1.3	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	258	431.9	A		-1.4	61.10 - 802.70	(ug/kg)
Diethylphthalate	297	459.6	A		-1.4	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	180	369.9	A		-1.9	63.91 - 675.97	(ug/kg)
Phenanthrene	245	494.4	A		-1.9	95.33 - 893.50	(ug/kg)
Anthracene	215	382.7	A		-1.5	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	185	364	A		-1.3	QL - 764.35	(ug/kg)
Di-n-butylphthalate	28.9						(ug/kg)
Pyrene	200	465	A		-1.7	QL - 937.81	(ug/kg)
Benzo(a)anthracene	229	464	A		-1.5	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	1510	2957	A		-1.2	QL - 6706.45	(ug/kg)

- Flags:** A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FGL Environmental
GROW01
 853 Corporation St.

Santa Paula CA 93060

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	60.40	70	A		-13.7	49.00 - 91.00			(mg/kg)
Barium	261.32	300	A		-12.9	210.00 - 390.00			(mg/kg)
Beryllium	2.64		A						(mg/kg)
Cadmium	13.61	17.3	W		-21.3	12.11 - 22.49			(mg/kg)
Chromium	67.82	76	A		-10.8	53.20 - 98.80			(mg/kg)
Lead	31.35	38.1	A		-17.7	26.67 - 49.53			(mg/kg)
Nickel	21.20	24	A		-11.7	16.80 - 31.20			(mg/kg)
Selenium	16.11	18.5	A		-12.9	12.95 - 24.05			(mg/kg)
Silver	49.17	55.5	A		-11.4	38.85 - 72.15			(mg/kg)
Thallium	38.74	46.3	A		-16.3	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	49.42	53.9	A		-8.3	37.73 - 70.07			(mg/kg)
Zinc	69.31	74.5	A		-7.0	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	767.9	862	A		-10.9	603.40 - 1120.60	43.7		(Bq/kg)
Cesium-137	114.6	111	A		3.2	77.70 - 144.30	10.8		(Bq/kg)
Cobalt-57	237.1	246	A		-3.6	172.20 - 319.80	18.7		(Bq/kg)
Cobalt-60	87.02	87.5	A		-0.5	61.25 - 113.75	8.7		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	583.6	546	A		6.9	382.20 - 709.80	12.5	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	612.47	652	A		-6.1	456.40 - 847.60	60.1		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	869.8	809	A		7.5	566.30 - 1051.70	39.4		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FGL Environmental
GROW01 853 Corporation St.

Santa Paula CA 93060

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

HISL99

Environmental Agency of the Republic of Slovenia

Vojkova 1b

Ljubljana 1000 Slovenia 1000

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	66.1	70	A		-5.6	49.00 - 91.00	6.6		(mg/kg)
Barium	292	300	A		-2.7	210.00 - 390.00	29		(mg/kg)
Beryllium	NR								
Cadmium	17.5	17.3	A		1.2	12.11 - 22.49	1.8		(mg/kg)
Chromium	61.5	76	A		-19.1	53.20 - 98.80	6.2		(mg/kg)
Lead	43.4	38.1	A		13.9	26.67 - 49.53	4.3		(mg/kg)
Nickel	24.6	24	A		2.5	16.80 - 31.20	2.5		(mg/kg)
Selenium	16.2	18.5	A		-12.4	12.95 - 24.05	1.6		(mg/kg)
Silver	53.5	55.5	A		-3.6	38.85 - 72.15	5.4		(mg/kg)
Thallium	52.7	46.3	A		13.8	32.41 - 60.19	5.3		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	59.6	53.9	A		10.6	37.73 - 70.07	6.0		(mg/kg)
Zinc	57.4	74.5	W		-23.0	52.15 - 96.85	8.6		(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Environmental Agency of the Republic of Slovenia
HISL99
 Vojkova 1b
 Ljubljana 1000 Slovenia 1000

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

HWRL01 Lawrence Livermore National Laboratory - CES
7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	74.1	70	A		5.9	49.00 - 91.00			(mg/kg)
Barium	327.	300	A		9.0	210.00 - 390.00			(mg/kg)
Beryllium	NR								
Cadmium	18.3	17.3	A		5.8	12.11 - 22.49			(mg/kg)
Chromium	87.8	76	A		15.5	53.20 - 98.80			(mg/kg)
Lead	44.0	38.1	A		15.5	26.67 - 49.53			(mg/kg)
Nickel	26.1	24	A		8.8	16.80 - 31.20			(mg/kg)
Selenium	NR	18.5				12.95 - 24.05			
Silver	51.0	55.5	A		-8.1	38.85 - 72.15			(mg/kg)
Thallium	31.5	46.3	N		-32.0	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	69.0	53.9	W		28.0	37.73 - 70.07			(mg/kg)
Zinc	78.6	74.5	A		5.5	52.15 - 96.85			(mg/kg)
Americium-241	46.5	43.5	A		6.9	30.45 - 56.55	4.20		(Bq/kg)
Cesium-134	903.82	862	A		4.9	603.40 - 1120.60	17.34	L	(Bq/kg)
Cesium-137	132.10	111	A		19.0	77.70 - 144.30	6.44		(Bq/kg)
Cobalt-57	298.12	246	W		21.2	172.20 - 319.80	12.29		(Bq/kg)
Cobalt-60	106.05	87.5	W		21.2	61.25 - 113.75	4.18		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	678.99	546	W		24.4	382.20 - 709.80	23.78		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	30.3	33.3	A		-9.0	23.31 - 43.29	1.78		(Bq/kg)
Plutonium-239/240	66.1	72.9	A		-9.3	51.03 - 94.77	3.32		(Bq/kg)
Potassium-40	636.27	652	A		-2.4	456.40 - 847.60	65.88		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	211.	229	A		-7.9	160.30 - 297.70	14.8		(Bq/kg)
Uranium-235	7.12						1.63		(Bq/kg)
Uranium-238	214.	220	A		-2.7	154.00 - 286.00	14.1		(Bq/kg)
Zinc-65	1034.12	809	W		27.8	566.30 - 1051.70	34.87		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Lawrence Livermore National Laboratory - CES
HWRL01 7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Instituto Boliviano de Ciencia y Tech. Nuclear
IBTN99 Avenida 6 de Agosto 2905

La Paz Murillo 4821

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	58.001	70	A		-17.1	49.00 - 91.00	2.745		(mg/kg)
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	1.208	17.3	N		-93.0	12.11 - 22.49	0.11		(mg/kg)
Chromium	76.447	76	A		0.6	53.20 - 98.80	3.581		(mg/kg)
Lead	36.396	38.1	A		-4.5	26.67 - 49.53	1.088	L	(mg/kg)
Nickel	32.302	24	N		34.6	16.80 - 31.20	2.065		(mg/kg)
Selenium	25.666	18.5	N		38.7	12.95 - 24.05	1.725		(mg/kg)
Silver	0.0	55.5	N	False Negative	-100.0	38.85 - 72.15	0.0		(mg/kg)
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	87.031	74.5	A		16.8	52.15 - 96.85	3.042		(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Instituto Boliviano de Ciencia y Tech. Nuclear
IBTN99 Avenida 6 de Agosto 2905

La Paz Murillo 4821

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Radiation Hygiene Laboratory, Inst. of Public Health
IHPH99 Str. Dr. Leonte nr. 1-3

Bucharest sector 5 76256

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	47.5	43.5	A		9.2	30.45 - 56.55	6.2		(Bq/kg)
Cesium-134	866.7	862	A		0.5	603.40 - 1120.60	26.0	L	(Bq/kg)
Cesium-137	108.4	111	A		-2.3	77.70 - 144.30	3.4		(Bq/kg)
Cobalt-57	251.6	246	A		2.3	172.20 - 319.80	7.8		(Bq/kg)
Cobalt-60	89.5	87.5	A		2.3	61.25 - 113.75	2.8		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	531.5	546	A		-2.7	382.20 - 709.80	15.9	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	612.0	652	A		-6.1	456.40 - 847.60	22.0		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	198.3	220	A		-9.9	154.00 - 286.00	41.4	H	(Bq/kg)
Zinc-65	840.3	809	A		3.9	566.30 - 1051.70	61.2		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Radiation Hygiene Laboratory, Inst. of Public Health
IHPH99 Str. Dr. Leonte nr. 1-3

Bucharest sector 5 76256

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Inst. Of Public Health Timisoara
IPHT99 Bd. V. Babes nr. 16-18

Timisoara Romania RO19

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	40.23	43.5	A		-7.5	30.45 - 56.55	2.82		(Bq/kg)
Cesium-134	775.95	862	A		-10.0	603.40 - 1120.60	66.26		(Bq/kg)
Cesium-137	113.13	111	A		1.9	77.70 - 144.30	4.82		(Bq/kg)
Cobalt-57	225.59	246	A		-8.3	172.20 - 319.80	6.94		(Bq/kg)
Cobalt-60	79.97	87.5	A		-8.6	61.25 - 113.75	2.4		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	570.02	546	A		4.4	382.20 - 709.80	11.75	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	569.42	652	A		-12.7	456.40 - 847.60	42		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	168.66	220	W		-23.3	154.00 - 286.00	25.9		(Bq/kg)
Zinc-65	785.39	809	A		-2.9	566.30 - 1051.70	17.25	L	(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Inst. Of Public Health Timisoara
IPHT99 Bd. V. Babes nr. 16-18

Timisoara Romania RO19

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAWRENCE BERKELEY NATIONAL LABORATORY
LAWR01 1 CYCLOTRON DR.

BERKELEY CA 94720

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	833	862	A		-3.4	603.40 - 1120.60	170	H	(Bq/kg)
Cesium-137	114	111	A		2.7	77.70 - 144.30	20		(Bq/kg)
Cobalt-57	244	246	A		-0.8	172.20 - 319.80	23		(Bq/kg)
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	578	546	A		5.9	382.20 - 709.80	114		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	745	652	A		14.3	456.40 - 847.60	157	H	(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	934	809	A		15.5	566.30 - 1051.70	200	H	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAWRENCE BERKELEY NATIONAL LABORATORY
LAWR01 1 CYCLOTRON DR.
 BERKELEY CA 94720

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAWR02 Lawrence Livermore National Laboratory
7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	808	862	A		-6.3	603.40 - 1120.60	25		(Bq/kg)
Cesium-137	106	111	A		-4.5	77.70 - 144.30	3.5		(Bq/kg)
Cobalt-57	244	246	A		-0.8	172.20 - 319.80	8		(Bq/kg)
Cobalt-60	90.6	87.5	A		3.5	61.25 - 113.75	2.9		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	550	546	A		0.7	382.20 - 709.80	17		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	32.9	33.3	A		-1.2	23.31 - 43.29	1.6		(Bq/kg)
Plutonium-239/240	69.6	72.9	A		-4.5	51.03 - 94.77	2.3		(Bq/kg)
Potassium-40	606	652	A		-7.1	456.40 - 847.60	21		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	830	809	A		2.6	566.30 - 1051.70	26		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
W = Result acceptable with warning 20% < Bias <= 30%
N = Result not acceptable Bias > 30%
L = Uncertainty potentially too low (for information purposes only)
H = Uncertainty potentially too high (for information purposes only)
QL = Detection Limit
RW = Report Warning
NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAWR02 Lawrence Livermore National Laboratory
7000 East Avenue

Livermore CA 94550

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

National Institute for Physics and Nuclear Engineering
LEPD99 Life and Environmental Physics Department
 Bucharest Magurele R-769

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	55.5	43.5	W		27.6	30.45 - 56.55	2.5		(Bq/kg)
Cesium-134	789	862	A		-8.5	603.40 - 1120.60	25		(Bq/kg)
Cesium-137	127.4	111	A		14.8	77.70 - 144.30	4.7		(Bq/kg)
Cobalt-57	283.8	246	A		15.4	172.20 - 319.80	13.0		(Bq/kg)
Cobalt-60	81.8	87.5	A		-6.5	61.25 - 113.75	3.7		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	550.8	546	A		0.9	382.20 - 709.80	19.3		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	9.8		N	False Positive			2.7		(Bq/kg)
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	704.0	809	A		-13.0	566.30 - 1051.70	28.4		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

National Institute for Physics and Nuclear Engineering
LEPD99 Life and Environmental Physics Department
 Bucharest Magurele R-769

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

BBWI Analytical Laboratories Department
LOCK01 P.O. Box 1625

Idaho Falls ID 83415

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	69.9	70	A		-0.1	49.00 - 91.00	14.0	H	(mg/kg)
Barium	279	300	A		-7.0	210.00 - 390.00	56	H	(mg/kg)
Beryllium	NR								
Cadmium	16.6	17.3	A		-4.0	12.11 - 22.49	3.3		(mg/kg)
Chromium	69.0	76	A		-9.2	53.20 - 98.80	13.8		(mg/kg)
Lead	37.1	38.1	A		-2.6	26.67 - 49.53	7.4		(mg/kg)
Nickel	22.7	24	A		-5.4	16.80 - 31.20	4.5		(mg/kg)
Selenium	17.0	18.5	A		-8.1	12.95 - 24.05	3.4		(mg/kg)
Silver	55.5	55.5	A		0.0	38.85 - 72.15	11.1		(mg/kg)
Thallium	37.0	46.3	W		-20.1	32.41 - 60.19	7.4		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	45.7	53.9	A		-15.2	37.73 - 70.07	9.1		(mg/kg)
Zinc	68.8	74.5	A		-7.7	52.15 - 96.85	13.8	H	(mg/kg)
Americium-241	42.4	43.5	A		-2.5	30.45 - 56.55	3.3		(Bq/kg)
Cesium-134	739.5	862	A		-14.2	603.40 - 1120.60	30.1		(Bq/kg)
Cesium-137	99.8	111	A		-10.1	77.70 - 144.30	4.9		(Bq/kg)
Cobalt-57	223	246	A		-9.4	172.20 - 319.80	9.8		(Bq/kg)
Cobalt-60	85.6	87.5	A		-2.2	61.25 - 113.75	3.8		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	535	546	A		-2.0	382.20 - 709.80	19.8		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	34.3	33.3	A		3.0	23.31 - 43.29	1.8		(Bq/kg)
Plutonium-239/240	69.9	72.9	A		-4.1	51.03 - 94.77	4.3		(Bq/kg)
Potassium-40	630	652	A		-3.4	456.40 - 847.60	60.2		(Bq/kg)
Strontium-90	8.3		A				4.8		(Bq/kg)
Uranium-234/233	214	229	A		-6.6	160.30 - 297.70	13		(Bq/kg)
Uranium-238	222	220	A		0.9	154.00 - 286.00	7		(Bq/kg)
Zinc-65	816	809	A		0.9	566.30 - 1051.70	34.8		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

BBWI Analytical Laboratories Department
LOCK01 P.O. Box 1625

Idaho Falls ID 83415

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	18	18.3	A		0.0	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	36	64.8	A		-1.3	QL - 133.51	(ug/kg)
Tetrachloroethene	26	114.2	A		-1.1	QL - 356.01	(ug/kg)
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	38	130.3	A		-1.0	QL - 420.60	(ug/kg)
m & p-Xylene	37	153.7	A		-1.0	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	388	972	A		-1.1	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6				33.88 - 675.26	
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	238	436.4	A		-1.5	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	196	431.9	A		-1.9	61.10 - 802.70	(ug/kg)
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	214	369.9	A		-1.5	63.91 - 675.97	(ug/kg)
Phenanthrene	312	494.4	A		-1.4	95.33 - 893.50	(ug/kg)
Anthracene	254	382.7	A		-1.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	302	465	A		-1.0	QL - 937.81	(ug/kg)
Benzo(a)anthracene	262	464	A		-1.3	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

A = Result acceptable	Z-score <=2.0)
W = Result acceptable with warning	2.0 < Z-score <=3.0)
N = Result not acceptable	Z-score > 3.0)
L = Uncertainty potentially too low (for infomation purposes only)	
H = Uncertainty potentially too high (for information purposes only)	
QL = Detection Limit	
RW = Report Warning	
NR = Not Reported	

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RADIATION MEASUREMENTS LABORATORY/AEDL
LOCK03 INEEL

Idaho Falls ID 83415

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	44.1	43.5	A		1.4	30.45 - 56.55	2.7		(Bq/kg)
Cesium-134	859	862	A		-0.3	603.40 - 1120.60	61		(Bq/kg)
Cesium-137	113	111	A		1.8	77.70 - 144.30	8		(Bq/kg)
Cobalt-57	244	246	A		-0.8	172.20 - 319.80	17		(Bq/kg)
Cobalt-60	97	87.5	A		10.9	61.25 - 113.75	7		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	592	546	A		8.4	382.20 - 709.80	42		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	32.8	33.3	A		-1.5	23.31 - 43.29	1.9		(Bq/kg)
Plutonium-239/240	69.6	72.9	A		-4.5	51.03 - 94.77	4.0		(Bq/kg)
Potassium-40	639	652	A		-2.0	456.40 - 847.60	50		(Bq/kg)
Strontium-90	-1.3		A				4.2		(Bq/kg)
Uranium-234/233	214	229	A		-6.6	160.30 - 297.70	11		(Bq/kg)
Uranium-235	14						1		(Bq/kg)
Uranium-238	222	220	A		0.9	154.00 - 286.00	11		(Bq/kg)
Zinc-65	900	809	A		11.2	566.30 - 1051.70	64		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
W = Result acceptable with warning 20% < Bias <= 30%
N = Result not acceptable Bias > 30%
L = Uncertainty potentially too low (for infomation purposes only)
H = Uncertainty potentially too high (for information purposes only)
QL = Detection Limit
RW = Report Warning
NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RADIATION MEASUREMENTS LABORATORY/AEDL
LOCK03 INEEL

Idaho Falls ID 83415

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Center for Environmental Chemistry SPA
LPTO99 82 Lenin av.

Obninsk Kaluga re 24903

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	72.7	72.1	A	Total Metal	0.8	50.47 - 93.73	14.2		(mg/kg)
Barium	800	861	A	Total Metal	-7.1	602.70 - 1119.30	160		(mg/kg)
Beryllium	NR								
Cadmium	18.2	17.3	A		5.2	12.11 - 22.49	3.6		(mg/kg)
Chromium	130	125	A	Total Metal	4.0	87.50 - 162.50	26		(mg/kg)
Lead	42.4	42.4	A	Total Metal	0.0	29.68 - 55.12	8.4		(mg/kg)
Nickel	25.6	28.9	A	Total Metal	-11.4	20.23 - 37.57	5.1		(mg/kg)
Selenium	19	18.5	A		2.7	12.95 - 24.05	4	H	(mg/kg)
Silver	56.0	55.5	A		0.9	38.85 - 72.15	11.1		(mg/kg)
Thallium	60.2	46.3	N		30.0	32.41 - 60.19	12.1	H	(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	110	110	A	Total Metal	0.0	77.00 - 143.00	22		(mg/kg)
Zinc	92.8	91	A	Total Metal	2.0	63.70 - 118.30	18.5		(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LPTO99 Center for Environmental Chemistry SPA
82 Lenin av.
Obninsk Kaluga re 24903

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	324	251.2	A		0.8	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	373	266.4	A		1.1	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	475	354.6	A		1.1	33.88 - 675.26	(ug/kg)
Naphthalene	466	398.4	A		0.6	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	145	167	A		-0.4	QL - 344.31	(ug/kg)
2-Chloronaphthalene	445	386.8	A		0.7	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	751	436.4	W		2.4	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	910	431.9	N		3.9	61.10 - 802.70	(ug/kg)
Diethylphthalate	706	459.6	W		2.1	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	338	369.9	A		-0.3	63.91 - 675.97	(ug/kg)
Phenanthrene	622	494.4	A		1.0	95.33 - 893.50	(ug/kg)
Anthracene	459	382.7	A		0.7	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	220	290.5	A		-0.7	QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	170	311.9	A		-1.1	QL - 688.44	(ug/kg)
Pentachlorobenzene	452	364	A		0.7	QL - 764.35	(ug/kg)
Pyrene	709	465	A		1.5	QL - 937.81	(ug/kg)
Benzo(a)anthracene	855	464	W		2.4	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	880	2957	A		-1.7	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score <=2.0)

W = Result acceptable with warning $2.0 < Z\text{-score} \leq 3.0$)

N = Result not acceptable Z-score > 3.0)

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

USEC, Inc.
MART01 Lab COC, Bldg. X-710, Rm 222

Piketon OH 45661

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	54.8	70	W		-21.7	49.00 - 91.00	12.1	H	(mg/kg)
Barium	303	300	A		1.0	210.00 - 390.00	11.5		(mg/kg)
Beryllium	NR								
Cadmium	22.4	17.3	W		29.5	12.11 - 22.49	0.5	L	(mg/kg)
Chromium	87.5	76	A		15.1	53.20 - 98.80	3.8		(mg/kg)
Lead	57.5	38.1	N		50.9	26.67 - 49.53	6.5		(mg/kg)
Nickel	26.0	24	A		8.3	16.80 - 31.20	2.6		(mg/kg)
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	52.4	46.3	A		13.2	32.41 - 60.19	11.6	H	(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	60.4	53.9	A		12.1	37.73 - 70.07	3.4		(mg/kg)
Zinc	110	74.5	N		47.7	52.15 - 96.85	8.1		(mg/kg)
Americium-241	42.12	43.5	A		-3.2	30.45 - 56.55	4.82		(Bq/kg)
Cesium-134	704	862	A		-18.3	603.40 - 1120.60	31		(Bq/kg)
Cesium-137	98.9	111	A		-10.9	77.70 - 144.30	5.4		(Bq/kg)
Cobalt-57	217	246	A		-11.8	172.20 - 319.80	8.5		(Bq/kg)
Cobalt-60	87.3	87.5	A		-0.2	61.25 - 113.75	2.6	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	541	546	A		-0.9	382.20 - 709.80	19.5		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	38.76	33.3	A		16.4	23.31 - 43.29	4.36		(Bq/kg)
Plutonium-239/240	81.23	72.9	A		11.4	51.03 - 94.77	8.03		(Bq/kg)
Potassium-40	626	652	A		-4.0	456.40 - 847.60	25		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	201.13	229	A		-12.2	160.30 - 297.70	13.82		(Bq/kg)
Uranium-238	212.4	220	A		-3.5	154.00 - 286.00	17.39		(Bq/kg)
Zinc-65	825	809	A		2.0	566.30 - 1051.70	21	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

USEC, Inc.
MART01 Lab COC, Bldg. X-710, Rm 222
 Piketon OH 45661

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	390	354.6	A		0.3	33.88 - 675.26	(ug/kg)
Naphthalene	440	398.4	A		0.4	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	450	386.8	A		0.7	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	500	436.4	A		0.5	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	520	431.9	A		0.7	61.10 - 802.70	(ug/kg)
Diethylphthalate	540	459.6	A		0.7	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	440	369.9	A		0.7	63.91 - 675.97	(ug/kg)
Phenanthrene	530	494.4	A		0.3	95.33 - 893.50	(ug/kg)
Anthracene	370	382.7	A		-0.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	410	465	A		-0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	500	464	A		0.2	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3300	2957	A		0.3	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score ≤ 2.0
 W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

United States Enrichment Corporation
MART02 5600 Hobbs Road

Paducah KY 42001

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	67.5	70	A		-3.6	49.00 - 91.00			(mg/kg)
Barium	272	300	A		-9.3	210.00 - 390.00			(mg/kg)
Beryllium	1.17		A						(mg/kg)
Cadmium	15.5	17.3	A		-10.4	12.11 - 22.49			(mg/kg)
Chromium	67.8	76	A		-10.8	53.20 - 98.80			(mg/kg)
Lead	27.4	38.1	W		-28.1	26.67 - 49.53			(mg/kg)
Nickel	17.4	24	W		-27.5	16.80 - 31.20			(mg/kg)
Selenium	16.8	18.5	A		-9.2	12.95 - 24.05			(mg/kg)
Silver	NR	55.5				38.85 - 72.15			
Thallium	24.3	46.3	N		-47.5	32.41 - 60.19			(mg/kg)
Uranium-Total	13.2	18.5	W		-28.6	12.95 - 24.05			(mg/kg)
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	51.8	53.9	A		-3.9	37.73 - 70.07			(mg/kg)
Zinc	68.0	74.5	A		-8.7	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	865	862	A		0.3	603.40 - 1120.60	88.6		(Bq/kg)
Cesium-137	120	111	A		8.1	77.70 - 144.30	12.9		(Bq/kg)
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	105	87.5	A		20.0	61.25 - 113.75	10.7		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	33.1	33.3	A		-0.6	23.31 - 43.29	6.68	H	(Bq/kg)
Plutonium-239/240	70.9	72.9	A		-2.7	51.03 - 94.77	13.7		(Bq/kg)
Potassium-40	699	652	A		7.2	456.40 - 847.60	75.9		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

United States Enrichment Corporation
MART02
 5600 Hobbs Road

Paducah KY 42001

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	150	26.6	W		5.4	QL - 95.57	(ug/kg)
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	71	64.8	A		0.3	QL - 133.51	(ug/kg)
Tetrachloroethene	180	114.2	A		0.8	QL - 356.01	(ug/kg)
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	190	130.3	A		0.6	QL - 420.60	(ug/kg)
m & p-Xylene	260	153.7	A		0.9	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	830	972	A		-0.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6				33.88 - 675.26	
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Radioactive Material Analysis Laboratory
MART03 ORNL

Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	310	300	A		3.3	210.00 - 390.00			(mg/kg)
Beryllium	.882		A						(mg/kg)
Cadmium	17.9	17.3	A		3.5	12.11 - 22.49			(mg/kg)
Chromium	81.5	76	A		7.2	53.20 - 98.80			(mg/kg)
Lead	42.6	38.1	A		11.8	26.67 - 49.53			(mg/kg)
Nickel	26.2	24	A		9.2	16.80 - 31.20			(mg/kg)
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	47.4	46.3	A		2.4	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	52.5	53.9	A		-2.6	37.73 - 70.07			(mg/kg)
Zinc	74.7	74.5	A		0.3	52.15 - 96.85			(mg/kg)
Americium-241	39	43.5	A		-10.3	30.45 - 56.55	2		(Bq/kg)
Cesium-134	640	862	W		-25.8	603.40 - 1120.60	10	L	(Bq/kg)
Cesium-137	93	111	A		-16.2	77.70 - 144.30	3		(Bq/kg)
Cobalt-57	200	246	A		-18.7	172.20 - 319.80	10		(Bq/kg)
Cobalt-60	80	87.5	A		-8.6	61.25 - 113.75	3		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	500	546	A		-8.4	382.20 - 709.80	10	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	30	33.3	A		-9.9	23.31 - 43.29	3		(Bq/kg)
Plutonium-239/240	65	72.9	A		-10.8	51.03 - 94.77	4		(Bq/kg)
Potassium-40	570	652	A		-12.6	456.40 - 847.60	25		(Bq/kg)
Strontium-90	0.58		A				0.90		(Bq/kg)
Uranium-234/233	215	229	A		-6.1	160.30 - 297.70	11		(Bq/kg)
Uranium-238	213	220	A		-3.2	154.00 - 286.00	11		(Bq/kg)
Zinc-65	770	809	A		-4.8	566.30 - 1051.70	14	L	(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Radioactive Material Analysis Laboratory
MART03 ORNL

Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

MDPH-Radiation Control Program
MDPH01 MERL-Room 002

Jamaica Plain MA 02130

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	28	43.5	N		-35.6	30.45 - 56.55	2		(Bq/kg)
Cesium-134	738	862	A		-14.4	603.40 - 1120.60	9	L	(Bq/kg)
Cesium-137	98	111	A		-11.7	77.70 - 144.30	3		(Bq/kg)
Cobalt-57	210	246	A		-14.6	172.20 - 319.80	6	L	(Bq/kg)
Cobalt-60	86	87.5	A		-1.7	61.25 - 113.75	2	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	510	546	A		-6.6	382.20 - 709.80	12	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	12	72.9	N		-83.5	51.03 - 94.77	1		(Bq/kg)
Potassium-40	568	652	A		-12.9	456.40 - 847.60	23		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	179	220	A		-18.6	154.00 - 286.00	22		(Bq/kg)
Zinc-65	781	809	A		-3.5	566.30 - 1051.70	18	L	(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

MDPH-Radiation Control Program

MDPH01 MERL-Room 002

Jamaica Plain MA 02130

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags: A = Result acceptable Z-score <=2.0)

W = Result acceptable with warning 2.0 < Z-score <=3.0)

N = Result not acceptable Z-score > 3.0)

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Mountain States Analytical, Inc.
MOUN01 1645 West 2200 South

Salt Lake City UT 84119

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	62.7	70	A		-10.4	49.00 - 91.00	2.7		(mg/kg)
Barium	275	300	A		-8.3	210.00 - 390.00	7	L	(mg/kg)
Beryllium	0.851		A				0.134		(mg/kg)
Cadmium	14.0	17.3	A		-19.1	12.11 - 22.49	0.5		(mg/kg)
Chromium	71.4	76	A		-6.1	53.20 - 98.80	1.5	L	(mg/kg)
Lead	29.3	38.1	W		-23.1	26.67 - 49.53	2.7		(mg/kg)
Nickel	21.1	24	A		-12.1	16.80 - 31.20	1.8		(mg/kg)
Selenium	14	18.5	W		-24.3	12.95 - 24.05	9	H	(mg/kg)
Silver	48.8	55.5	A		-12.1	38.85 - 72.15	1.4	L	(mg/kg)
Thallium	40.3	46.3	A		-13.0	32.41 - 60.19	7.1		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	55.7	53.9	A		3.3	37.73 - 70.07	1.6	L	(mg/kg)
Zinc	71.5	74.5	A		-4.0	52.15 - 96.85	4.5		(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Mountain States Analytical, Inc.

MOUN01 1645 West 2200 South

Salt Lake City

UT

84119

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	103	236.8	A		-0.5	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	92.0	214.2	A		-0.5	QL - 975.47	(ug/kg)
Chloroform	19.3	4.6					(ug/kg)
Trichloroethene	17.4	26.6	A		-0.4	QL - 95.57	(ug/kg)
t-butylbenzene	86.0	107.4	A		-0.2	QL - 415.31	(ug/kg)
Toluene	21.0	18.3	A		0.2	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	51.0	64.8	A		-0.6	QL - 133.51	(ug/kg)
Tetrachloroethene	89.5	114.2	A		-0.3	QL - 356.01	(ug/kg)
n-butylbenzene	64.4	78.6	A		-0.2	QL - 299.81	(ug/kg)
Ethylbenzene	76.2	130.3	A		-0.6	QL - 420.60	(ug/kg)
m & p-Xylene	84.4	153.7	A		-0.6	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1500	972	A		1.0	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	300	251.2	A		0.5	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	300	266.4	A		0.4	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	390	354.6	A		0.3	33.88 - 675.26	(ug/kg)
Naphthalene	430	398.4	A		0.3	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	440	386.8	A		0.6	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	470	436.4	A		0.3	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	470	431.9	A		0.3	61.10 - 802.70	(ug/kg)
Diethylphthalate	470	459.6	A		0.1	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	440	369.9	A		0.7	63.91 - 675.97	(ug/kg)
Phenanthrene	530	494.4	A		0.3	95.33 - 893.50	(ug/kg)
Anthracene	480	382.7	A		0.9	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	520	465	A		0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	550	464	A		0.5	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3360	2957	A		0.3	QL - 6706.45	(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

NARL01
National Air and Radiation Environmental Laboratory
540 S. Morris Ave.
Montgomery AL 36115

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Antimony	1.192								(mg/kg)
Arsenic	72.244	70	A		3.2	49.00 - 91.00			(mg/kg)
Barium	333.25	300	A		11.1	210.00 - 390.00			(mg/kg)
Beryllium	0.992		A						(mg/kg)
Cadmium	15.643	17.3	A		-9.6	12.11 - 22.49			(mg/kg)
Chromium	86.617	76	A		14.0	53.20 - 98.80			(mg/kg)
Copper	20.941								(mg/kg)
Lead	39.96	38.1	A		4.9	26.67 - 49.53			(mg/kg)
Nickel	26.763	24	A		11.5	16.80 - 31.20			(mg/kg)
Selenium	18.905	18.5	A		2.2	12.95 - 24.05			(mg/kg)
Silver	53.694	55.5	A		-3.3	38.85 - 72.15			(mg/kg)
Thallium	49.533	46.3	A		7.0	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	57.384	53.9	A		6.5	37.73 - 70.07			(mg/kg)
Zinc	78.749	74.5	A		5.7	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	825	862	A		-4.3	603.40 - 1120.60	24	L	(Bq/kg)
Cesium-137	122.7	111	A		10.5	77.70 - 144.30	3.6	L	(Bq/kg)
Cobalt-57	261.9	246	A		6.5	172.20 - 319.80	7.5	L	(Bq/kg)
Cobalt-60	97.7	87.5	A		11.7	61.25 - 113.75	2.8	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	639	546	A		17.0	382.20 - 709.80	18	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	36.0	33.3	A		8.1	23.31 - 43.29	4.4		(Bq/kg)
Plutonium-239/240	69.7	72.9	A		-4.4	51.03 - 94.77	6.6		(Bq/kg)
Potassium-40	693	652	A		6.3	456.40 - 847.60	21		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	200.0	229	A		-12.7	160.30 - 297.70	15		(Bq/kg)
Uranium-238	208	220	A		-5.5	154.00 - 286.00	15		(Bq/kg)
Zinc-65	964	809	A		19.2	566.30 - 1051.70	27	L	(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

National Air and Radiation Environmental Laboratory
NARL01
540 S. Morris Ave.

Montgomery AL 36115

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	365	251.2	A		1.2	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	395	266.4	A		1.4	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	460	354.6	A		1.0	33.88 - 675.26	(ug/kg)
Naphthalene	508	398.4	A		0.9	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	458	386.8	A		0.8	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	563	436.4	A		1.0	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	530	431.9	A		0.8	61.10 - 802.70	(ug/kg)
Diethylphthalate	537	459.6	A		0.7	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	495	369.9	A		1.2	63.91 - 675.97	(ug/kg)
Phenanthrene	614	494.4	A		0.9	95.33 - 893.50	(ug/kg)
Anthracene	463	382.7	A		0.7	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	498	364	A		1.0	QL - 764.35	(ug/kg)
Pyrene	616	465	A		1.0	QL - 937.81	(ug/kg)
Benzo(a)anthracene	579	464	A		0.7	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3770	2957	A		0.6	QL - 6706.45	(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

BWXT Services-Nuclear Environmental Laboratory Service
NESI01 Lynchburg Technology Center
 Lynchburg VA 24504

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	72.9	70	A		4.1	49.00 - 91.00			(mg/kg)
Barium	260	300	A		-13.3	210.00 - 390.00			(mg/kg)
Beryllium	NR								
Cadmium	16.6	17.3	A		-4.0	12.11 - 22.49			(mg/kg)
Chromium	68.8	76	A		-9.5	53.20 - 98.80			(mg/kg)
Lead	35.4	38.1	A		-7.1	26.67 - 49.53			(mg/kg)
Nickel	21.7	24	A		-9.6	16.80 - 31.20			(mg/kg)
Selenium	14.9	18.5	A		-19.5	12.95 - 24.05			(mg/kg)
Silver	27.8	55.5	N		-49.9	38.85 - 72.15			(mg/kg)
Thallium	54.9	46.3	A		18.6	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	38.6	53.9	W		-28.4	37.73 - 70.07			(mg/kg)
Zinc	60.5	74.5	A		-18.8	52.15 - 96.85			(mg/kg)
Americium-241	43.2	43.5	A		-0.7	30.45 - 56.55	5.2		(Bq/kg)
Cesium-134	866	862	A		0.5	603.40 - 1120.60	88		(Bq/kg)
Cesium-137	126	111	A		13.5	77.70 - 144.30	13		(Bq/kg)
Cobalt-57	299	246	W		21.5	172.20 - 319.80	31		(Bq/kg)
Cobalt-60	110	87.5	W		25.7	61.25 - 113.75	11		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	662	546	W		21.2	382.20 - 709.80	71		(Bq/kg)
Nickel-63	1240	1180	A		5.1	826.00 - 1534.00	230		(Bq/kg)
Plutonium-238	31.3	33.3	A		-6.0	23.31 - 43.29	3.7		(Bq/kg)
Plutonium-239/240	65.2	72.9	A		-10.6	51.03 - 94.77	6.5		(Bq/kg)
Potassium-40	722	652	A		10.7	456.40 - 847.60	73		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	252	229	A		10.0	160.30 - 297.70	22		(Bq/kg)
Uranium-238	263	220	A		19.5	154.00 - 286.00	23		(Bq/kg)
Zinc-65	1030	809	W		27.3	566.30 - 1051.70	100		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

BWXT Services-Nuclear Environmental Laboratory Service
NESI01 Lynchburg Technology Center
 Lynchburg VA 24504

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	11.5	236.8	A		-0.9	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	15.6	214.2	A		-0.8	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	11.2	26.6	A		-0.7	QL - 95.57	(ug/kg)
t-butylbenzene	9.5	107.4	A		-1.0	QL - 415.31	(ug/kg)
Toluene	2.9	18.3	A		-1.1	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	12.1	64.8	W		-2.3	QL - 133.51	(ug/kg)
Tetrachloroethene	9.5	114.2	A		-1.3	QL - 356.01	(ug/kg)
n-butylbenzene	5.2	78.6	A		-1.0	QL - 299.81	(ug/kg)
Ethylbenzene	12.3	130.3	A		-1.2	QL - 420.60	(ug/kg)
m & p-Xylene	13.6	153.7	A		-1.2	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	126	972	A		-1.7	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	382	354.6	A		0.3	33.88 - 675.26	(ug/kg)
Naphthalene	436	398.4	A		0.3	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	224	167	A		1.0	QL - 344.31	(ug/kg)
2-Chloronaphthalene	421	386.8	A		0.4	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	463	436.4	A		0.2	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	453	431.9	A		0.2	61.10 - 802.70	(ug/kg)
Diethylphthalate	457	459.6	A		0.0	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	416	369.9	A		0.5	63.91 - 675.97	(ug/kg)
Phenanthrene	525	494.4	A		0.2	95.33 - 893.50	(ug/kg)
Anthracene	439	382.7	A		0.5	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	435	311.9	A		1.0	QL - 688.44	(ug/kg)
Pentachlorobenzene	430	364	A		0.5	QL - 764.35	(ug/kg)
Pyrene	397	465	A		-0.4	QL - 937.81	(ug/kg)
Benzo(a)anthracene	535	464	A		0.4	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2850	2957	A		-0.1	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score ≤ 2.0
 W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

NMLA01 Assaiggi Analytical Laboratories
7300 Jefferson NE

Albuquerque NM 87109

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Aluminum	20500								(mg/kg)
Antimony	2.3								(mg/kg)
Arsenic	86.6	70	W		23.7	49.00 - 91.00			(mg/kg)
Barium	299	300	A		-0.3	210.00 - 390.00			(mg/kg)
Beryllium	1.15			A					(mg/kg)
Cadmium	22.6	17.3	N		30.6	12.11 - 22.49			(mg/kg)
Calcium	47800								(mg/kg)
Chromium	79.8	76	A		5.0	53.20 - 98.80			(mg/kg)
Cobalt	8.5								(mg/kg)
Copper	19.9								(mg/kg)
Iron	20900								(mg/kg)
Lead	44.2	38.1	A		16.0	26.67 - 49.53			(mg/kg)
Magnesium	12500								(mg/kg)
Manganese	410								(mg/kg)
Nickel	25.3	24	A		5.4	16.80 - 31.20			(mg/kg)
Potassium	3950								(mg/kg)
Selenium	23.9	18.5	W		29.2	12.95 - 24.05			(mg/kg)
Silver	53.1	55.5	A		-4.3	38.85 - 72.15			(mg/kg)
Sodium	1490								(mg/kg)
Thallium	50.9	46.3	A		9.9	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	54.7	53.9	A		1.5	37.73 - 70.07			(mg/kg)
Zinc	50.6	74.5	N		-32.1	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

NMLA01 Assaiggi Analytical Laboratories
7300 Jefferson NE

Albuquerque NM 87109

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	228	251.2	A		-0.2	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	254	266.4	A		-0.1	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	287	354.6	A		-0.6	33.88 - 675.26	(ug/kg)
Naphthalene	349	398.4	A		-0.4	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	413	386.8	A		0.3	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	394	436.4	A		-0.3	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	368	431.9	A		-0.5	61.10 - 802.70	(ug/kg)
Diethylphthalate	413	459.6	A		-0.4	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	319	369.9	A		-0.5	63.91 - 675.97	(ug/kg)
Phenanthrene	421	494.4	A		-0.6	95.33 - 893.50	(ug/kg)
Anthracene	338	382.7	A		-0.4	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	421	465	A		-0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	390	464	A		-0.5	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2360	2957	A		-0.5	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score <=2.0
W = Result acceptable with warning 2.0 < Z-score <=3.0
N = Result not acceptable Z-score > 3.0
L = Uncertainty potentially too low (for infomation purposes only)
H = Uncertainty potentially too high (for information purposes only)
QL = Detection Limit
RW = Report Warning
NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

National Radiation Laboratory
NRLL99
108 Victoria St

Christchurch Christchu 8000

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	40.1	43.5	A		-7.8	30.45 - 56.55	4.5		(Bq/kg)
Cesium-134	838	862	A		-2.8	603.40 - 1120.60	22	L	(Bq/kg)
Cesium-137	109.9	111	A		-1.0	77.70 - 144.30	7.0		(Bq/kg)
Cobalt-57	242	246	A		-1.6	172.20 - 319.80	18		(Bq/kg)
Cobalt-60	99.3	87.5	A		13.5	61.25 - 113.75	3.7		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	587	546	A		7.5	382.20 - 709.80	37		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	615	652	A		-5.7	456.40 - 847.60	32		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	866	809	A		7.0	566.30 - 1051.70	41		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

National Radiation Laboratory
NRLL99
 108 Victoria St
 Christchurch Christchu 8000

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

O'Brien & Gere Laboratories, Inc.
OBGL01 PO Box 4942

East Syracuse NY 13221

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	72	70	A		2.9	49.00 - 91.00	0.6	L	(mg/kg)
Barium	287	300	A		-4.3	210.00 - 390.00	0.6	L	(mg/kg)
Beryllium	<1		A				0.6		(mg/kg)
Cadmium	16.8	17.3	A		-2.9	12.11 - 22.49	0.6		(mg/kg)
Chromium	75.6	76	A		-0.5	53.20 - 98.80	0.6	L	(mg/kg)
Lead	35.5	38.1	A		-6.8	26.67 - 49.53	0.6	L	(mg/kg)
Nickel	23	24	A		-4.2	16.80 - 31.20	0.6	L	(mg/kg)
Selenium	18.3	18.5	A		-1.1	12.95 - 24.05	0.8		(mg/kg)
Silver	54.7	55.5	A		-1.4	38.85 - 72.15	0.1	L	(mg/kg)
Thallium	45.2	46.3	A		-2.4	32.41 - 60.19	0.6	L	(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	51.9	53.9	A		-3.7	37.73 - 70.07	0.6	L	(mg/kg)
Zinc	79	74.5	A		6.0	52.15 - 96.85	0.6	L	(mg/kg)
Americium-241	4.22E+01	43.5	A		-3.0	30.45 - 56.55	1.17E+01	H	(Bq/kg)
Cesium-134	6.78E+02	862	W		-21.3	603.40 - 1120.60	6.67E+01		(Bq/kg)
Cesium-137	9.46E+01	111	A		-14.8	77.70 - 144.30	1.67E+01		(Bq/kg)
Cobalt-57	2.32E+02	246	A		-5.7	172.20 - 319.80	4.03E+01		(Bq/kg)
Cobalt-60	8.82E+01	87.5	A		0.8	61.25 - 113.75	1.89E+01	H	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	5.09E+02	546	A		-6.8	382.20 - 709.80	9.39E+01		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	3.35E+01	33.3	A		0.6	23.31 - 43.29	9.92E+00	H	(Bq/kg)
Plutonium-239/240	6.49E+01	72.9	A		-11.0	51.03 - 94.77	1.90E+01	H	(Bq/kg)
Potassium-40	6.12E+02	652	A		-6.1	456.40 - 847.60	1.28E+02	H	(Bq/kg)
Strontium-90	1.38E+01		A				1.20E+01		(Bq/kg)
Uranium-234/233	2.12E+02	229	A		-7.4	160.30 - 297.70	5.95E+01	H	(Bq/kg)
Uranium-238	2.16E+02	220	A		-1.8	154.00 - 286.00	6.20E+01	H	(Bq/kg)
Zinc-65	8.31E+02	809	A		2.7	566.30 - 1051.70	1.56E+02		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

O'Brien & Gere Laboratories, Inc.
OBGL01 PO Box 4942
 East Syracuse NY 13221

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	270	214.2	A		0.2	QL - 975.47	(ug/kg)
Chloroform	<12			4.6			(ug/kg)
1,2-Dichloroethane	<12						(ug/kg)
Trichloroethene	62	26.6	A		1.5	QL - 95.57	(ug/kg)
t-butylbenzene	160	107.4	A		0.5	QL - 415.31	(ug/kg)
Toluene	23	18.3	A		0.3	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	82	64.8	A		0.8	QL - 133.51	(ug/kg)
Tetrachloroethene	130	114.2	A		0.2	QL - 356.01	(ug/kg)
n-butylbenzene	120	78.6	A		0.6	QL - 299.81	(ug/kg)
Ethylbenzene	180	130.3	A		0.5	QL - 420.60	(ug/kg)
m & p-Xylene	190	153.7	A		0.3	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1100	972	A		0.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6				33.88 - 675.26	
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	350	386.8	A		-0.4	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	450	436.4	A		0.1	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	450	431.9	A		0.1	61.10 - 802.70	(ug/kg)
Diethylphthalate	440	459.6	A		-0.2	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	390	369.9	A		0.2	63.91 - 675.97	(ug/kg)
Phenanthrene	500	494.4	A		0.0	95.33 - 893.50	(ug/kg)
Anthracene	390	382.7	A		0.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	500	465	A		0.2	QL - 937.81	(ug/kg)
Benzo(a)anthracene	500	464	A		0.2	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3300	2957	A		0.3	QL - 6706.45	(ug/kg)

- Flags:** A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

ORISE/ESSAP
ORIS01 PO Box 117

Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	44.5	43.5	A		2.3	30.45 - 56.55	6.9		(Bq/kg)
Cesium-134	765	862	A		-11.3	603.40 - 1120.60	32		(Bq/kg)
Cesium-137	104.4	111	A		-5.9	77.70 - 144.30	7.1		(Bq/kg)
Cobalt-57	237.8	246	A		-3.3	172.20 - 319.80	9.1		(Bq/kg)
Cobalt-60	96.5	87.5	A		10.3	61.25 - 113.75	6.0		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	535	546	A		-2.0	382.20 - 709.80	23		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	31.1	33.3	A		-6.6	23.31 - 43.29	3.9		(Bq/kg)
Plutonium-239/240	71.0	72.9	A		-2.6	51.03 - 94.77	7.2		(Bq/kg)
Potassium-40	574	652	A		-12.0	456.40 - 847.60	43		(Bq/kg)
Strontium-90	9.9		A				4.8		(Bq/kg)
Uranium-234/233	214	229	A		-6.6	160.30 - 297.70	27		(Bq/kg)
Uranium-238	220	220	A		0.0	154.00 - 286.00	28		(Bq/kg)
Zinc-65	788	809	A		-2.6	566.30 - 1051.70	34		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

ORISE/ESSAP
ORIS01
 PO Box 117
 Oak Ridge TN 37831

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Outreach Technologies, Inc.
OTLI01
311 N. Aspen

Broken Arrow OK 74012

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	68.79	70	A		-1.7	49.00 - 91.00			(mg/kg)
Barium	259	300	A		-13.7	210.00 - 390.00			(mg/kg)
Beryllium	NR								
Cadmium	17.16	17.3	A		-0.8	12.11 - 22.49			(mg/kg)
Chromium	77.36	76	A		1.8	53.20 - 98.80			(mg/kg)
Lead	32.27	38.1	A		-15.3	26.67 - 49.53			(mg/kg)
Nickel	23.56	24	A		-1.8	16.80 - 31.20			(mg/kg)
Selenium	15.17	18.5	A		-18.0	12.95 - 24.05			(mg/kg)
Silver	49.79	55.5	A		-10.3	38.85 - 72.15			(mg/kg)
Thallium	45.19	46.3	A		-2.4	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	35.76	53.9	N		-33.7	37.73 - 70.07			(mg/kg)
Zinc	77.6	74.5	A		4.2	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	735	862	A		-14.7	603.40 - 1120.60	31.7		(Bq/kg)
Cesium-137	93.1	111	A		-16.1	77.70 - 144.30	6.4		(Bq/kg)
Cobalt-57	228	246	A		-7.3	172.20 - 319.80	16.3		(Bq/kg)
Cobalt-60	80.8	87.5	A		-7.7	61.25 - 113.75	5.36		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	532	546	A		-2.6	382.20 - 709.80	33.4		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	604	652	A		-7.4	456.40 - 847.60	71.6		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	67.9	229	N		-70.3	160.30 - 297.70	11.3		(Bq/kg)
Uranium-238	74.7	220	N		-66.0	154.00 - 286.00	11.32		(Bq/kg)
Zinc-65	834	809	A		3.1	566.30 - 1051.70	70.0		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Outreach Technologies, Inc.
311 N. Aspen

Broken Arrow OK 74012

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL -	1017.70
1,2,4-Trimethylbenzene	NR	214.2				QL -	975.47
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL -	95.57
t-butylbenzene	NR	107.4				QL -	415.31
Toluene	NR	18.3				QL -	61.94
1,1,2-Trichloroethane	NR	64.8				QL -	133.51
Tetrachloroethene	NR	114.2				QL -	356.01
n-butylbenzene	NR	78.6				QL -	299.81
Ethylbenzene	NR	130.3				QL -	420.60
m & p-Xylene	NR	153.7				QL -	508.80
1,1,2,2-Tetrachloroethane	NR	972				QL -	2497.60
1,3-Dichlorobenzene	NR	251.2				QL -	539.81
1,2-Dichlorobenzene	NR	266.4				QL -	544.41
1,2,4-Trichlorobenzene	NR	354.6				33.88 -	675.26
Naphthalene	NR	398.4				45.71 -	751.21
2,6-Dichlorophenol	NR	167				QL -	344.31
2-Chloronaphthalene	NR	386.8				127.18 -	646.34
2,6-Dinitrotoluene	NR	436.4				39.41 -	833.45
2,4-Dinitrotoluene	NR	431.9				61.10 -	802.70
Diethylphthalate	NR	459.6				112.77 -	806.53
Hexachlorobenzene	NR	369.9				63.91 -	675.97
Phenanthrene	NR	494.4				95.33 -	893.50
Anthracene	NR	382.7				45.62 -	719.80
1,4-Dinitrobenzene	NR	290.5				QL -	596.80
1,3-Dinitrobenzene	NR	311.9				QL -	688.44
Pentachlorobenzene	NR	364				QL -	764.35
Pyrene	NR	465				QL -	937.81
Benzo(a)anthracene	NR	464				QL -	948.00
Bis(2-ethylhexyl)phthalate	NR	2957				QL -	6706.45

Flags:	A = Result acceptable	Z-score <=2.0)
	W = Result acceptable with warning	2.0 < Z-score <=3.0)
	N = Result not acceptable	Z-score > 3.0)
	L = Uncertainty potentially too low (for information purposes only)	
	H = Uncertainty potentially too high (for information purposes only)	
	QL = Detection Limit	
	RW = Report Warning	
	NR = Not Reported	

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

PRAP01
Shaw WPRAP Laboratory
Fernald WPRAP Field Office

Ross Ohio 45061

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	47.79	43.5	A		9.9	30.45 - 56.55	3.339		(Bq/kg)
Cesium-134	864.57	862	A		0.3	603.40 - 1120.60	46.188		(Bq/kg)
Cesium-137	120.74	111	A		8.8	77.70 - 144.30	8.10		(Bq/kg)
Cobalt-57	302.91	246	W		23.1	172.20 - 319.80	17.233		(Bq/kg)
Cobalt-60	100.95	87.5	A		15.4	61.25 - 113.75	6.117		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	641.33	546	A		17.5	382.20 - 709.80	42.488		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	671.55	652	A		3.0	456.40 - 847.60	52.694		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	989.75	809	W		22.3	566.30 - 1051.70	67.062		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Shaw WPRAP Laboratory
PRAP01 Fernald WPRAP Field Office
 Ross Ohio 45061

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Severn Trent Laboratories St. Louis
QUAN01 13715 Rider Trail North

Earth City MO 63045

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	73.2	70	A		4.6	49.00 - 91.00			(mg/kg)
Barium	308	300	A		2.7	210.00 - 390.00			(mg/kg)
Beryllium	<0.5		A						(mg/kg)
Cadmium	16.2	17.3	A		-6.4	12.11 - 22.49			(mg/kg)
Chromium	75.0	76	A		-1.3	53.20 - 98.80			(mg/kg)
Lead	36.2	38.1	A		-5.0	26.67 - 49.53			(mg/kg)
Nickel	23.7	24	A		-1.3	16.80 - 31.20			(mg/kg)
Selenium	18.5	18.5	A		0.0	12.95 - 24.05			(mg/kg)
Silver	56.6	55.5	A		2.0	38.85 - 72.15			(mg/kg)
Thallium	46.4	46.3	A		0.2	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	53.5	53.9	A		-0.7	37.73 - 70.07			(mg/kg)
Zinc	65.6	74.5	A		-11.9	52.15 - 96.85			(mg/kg)
Americium-241	48.2	43.5	A		10.8	30.45 - 56.55	14.6	H	(Bq/kg)
Cesium-134	822	862	A		-4.6	603.40 - 1120.60	103		(Bq/kg)
Cesium-137	119	111	A		7.2	77.70 - 144.30	17.5		(Bq/kg)
Cobalt-57	262	246	A		6.5	172.20 - 319.80	28		(Bq/kg)
Cobalt-60	96.1	87.5	A		9.8	61.25 - 113.75	12.8		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	602	546	A		10.3	382.20 - 709.80	73		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	31.6	33.3	A		-5.1	23.31 - 43.29	9.3	H	(Bq/kg)
Plutonium-239/240	73.7	72.9	A		1.1	51.03 - 94.77	17.6	H	(Bq/kg)
Potassium-40	658	652	A		0.9	456.40 - 847.60	94		(Bq/kg)
Strontium-90	11.3		A				20.7		(Bq/kg)
Uranium-234/233	192	229	A		-16.2	160.30 - 297.70	40	H	(Bq/kg)
Uranium-238	197	220	A		-10.5	154.00 - 286.00	41	H	(Bq/kg)
Zinc-65	901	809	A		11.4	566.30 - 1051.70	105		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Severn Trent Laboratories St. Louis
QUAN01 13715 Rider Trail North

Earth City MO 63045

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	64.8	236.8	A		-0.7	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	111	214.2	A		-0.4	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	6.12	26.6	A		-0.9	QL - 95.57	(ug/kg)
t-butylbenzene	59.0	107.4	A		-0.5	QL - 415.31	(ug/kg)
Toluene	7.99	18.3	A		-0.7	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	29.7	64.8	A		-1.5	QL - 133.51	(ug/kg)
Tetrachloroethene	34.7	114.2	A		-1.0	QL - 356.01	(ug/kg)
n-butylbenzene	57.9	78.6	A		-0.3	QL - 299.81	(ug/kg)
Ethylbenzene	45.0	130.3	A		-0.9	QL - 420.60	(ug/kg)
m & p-Xylene	50.2	153.7	A		-0.9	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	298	972	A		-1.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	157	251.2	A		-1.0	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	180	266.4	A		-0.9	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	305	354.6	A		-0.5	33.88 - 675.26	(ug/kg)
Naphthalene	286	398.4	A		-1.0	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	198	167	A		0.5	QL - 344.31	(ug/kg)
2-Chloronaphthalene	364	386.8	A		-0.3	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	352	436.4	A		-0.6	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	356	431.9	A		-0.6	61.10 - 802.70	(ug/kg)
Diethylphthalate	398	459.6	A		-0.5	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	340	369.9	A		-0.3	63.91 - 675.97	(ug/kg)
Phenanthrene	469	494.4	A		-0.2	95.33 - 893.50	(ug/kg)
Anthracene	394	382.7	A		0.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	303	290.5	A		0.1	QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	274	311.9	A		-0.3	QL - 688.44	(ug/kg)
Pentachlorobenzene	335	364	A		-0.2	QL - 764.35	(ug/kg)
Pyrene	410	465	A		-0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	408	464	A		-0.3	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	1710	2957	A		-1.0	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score ≤ 2.0
 W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

STL Knoxville
QUAN02 5815 Middlebrook Pike

Knoxville TN 37921

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	65.2	70	A		-6.9	49.00 - 91.00			(mg/kg)
Barium	265	300	A		-11.7	210.00 - 390.00			(mg/kg)
Beryllium	0.947		A						(mg/kg)
Cadmium	15.2	17.3	A		-12.1	12.11 - 22.49			(mg/kg)
Chromium	67.7	76	A		-10.9	53.20 - 98.80			(mg/kg)
Lead	32.7	38.1	A		-14.2	26.67 - 49.53			(mg/kg)
Nickel	20.9	24	A		-12.9	16.80 - 31.20			(mg/kg)
Selenium	16.7	18.5	A		-9.7	12.95 - 24.05			(mg/kg)
Silver	51.0	55.5	A		-8.1	38.85 - 72.15			(mg/kg)
Thallium	42.2	46.3	A		-8.9	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	47.6	53.9	A		-11.7	37.73 - 70.07			(mg/kg)
Zinc	69.9	74.5	A		-6.2	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

STL Knoxville
QUAN02 5815 Middlebrook Pike

Knoxville TN 37921

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	160	236.8	A		-0.3	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	244	214.2	A		0.1	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	12.5	26.6	A		-0.6	QL - 95.57	(ug/kg)
t-butylbenzene	181	107.4	A		0.7	QL - 415.31	(ug/kg)
Toluene	23.3	18.3	A		0.3	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	75.7	64.8	A		0.5	QL - 133.51	(ug/kg)
Tetrachloroethene	126	114.2	A		0.1	QL - 356.01	(ug/kg)
n-butylbenzene	154	78.6	A		1.0	QL - 299.81	(ug/kg)
Ethylbenzene	129	130.3	A		0.0	QL - 420.60	(ug/kg)
m & p-Xylene	145	153.7	A		-0.1	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	919	972	A		-0.1	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	149	251.2	A		-1.1	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	176	266.4	A		-1.0	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	215	354.6	A		-1.3	33.88 - 675.26	(ug/kg)
Naphthalene	243	398.4	A		-1.3	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	146	167	A		-0.4	QL - 344.31	(ug/kg)
2-Chloronaphthalene	282	386.8	A		-1.2	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	297	436.4	A		-1.1	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	268	431.9	A		-1.3	61.10 - 802.70	(ug/kg)
Diethylphthalate	355	459.6	A		-0.9	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	297	369.9	A		-0.7	63.91 - 675.97	(ug/kg)
Phenanthrene	358	494.4	A		-1.0	95.33 - 893.50	(ug/kg)
Anthracene	305	382.7	A		-0.7	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	275	364	A		-0.7	QL - 764.35	(ug/kg)
Pyrene	386	465	A		-0.5	QL - 937.81	(ug/kg)
Benzo(a)anthracene	360	464	A		-0.6	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	6080	2957	W		2.5	QL - 6706.45	(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SEVERN TRENT LABORATORIES - RICHLAND
QUAN03 2800 GEORGE WASHINGTON WAY
 RICHLAND WA 99352

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	42.8	43.5	A		-1.6	30.45 - 56.55	1.2	L	(Bq/kg)
Cesium-134	837	862	A		-2.9	603.40 - 1120.60	50		(Bq/kg)
Cesium-137	109	111	A		-1.8	77.70 - 144.30	7		(Bq/kg)
Cobalt-57	260	246	A		5.7	172.20 - 319.80	17		(Bq/kg)
Cobalt-60	92.6	87.5	A		5.8	61.25 - 113.75	5.6		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	594	546	A		8.8	382.20 - 709.80	35		(Bq/kg)
Nickel-63	1356	1180	A		14.9	826.00 - 1534.00	47		(Bq/kg)
Plutonium-238	37.2	33.3	A		11.7	23.31 - 43.29	3.3		(Bq/kg)
Plutonium-239/240	67.2	72.9	A		-7.8	51.03 - 94.77	5.5		(Bq/kg)
Potassium-40	650	652	A		-0.3	456.40 - 847.60	40		(Bq/kg)
Strontium-90	2.53		A				0.92		(Bq/kg)
Uranium-234/233	207	229	A		-9.6	160.30 - 297.70	18		(Bq/kg)
Uranium-238	211	220	A		-4.1	154.00 - 286.00	19		(Bq/kg)
Zinc-65	879	809	A		8.7	566.30 - 1051.70	52		(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SEVERN TRENT LABORATORIES - RICHLAND
QUAN03 2800 GEORGE WASHINGTON WAY
 RICHLAND WA 99352

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SIMALABS INTERNATIONAL
RECC01 6954 Cornell Rd. Suite 300

Cincinnati OH 45242

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	68.3	70	A		-2.4	49.00 - 91.00			(mg/kg)
Barium	281	300	A		-6.3	210.00 - 390.00			(mg/kg)
Beryllium	0.80		A						(mg/kg)
Cadmium	15.9	17.3	A		-8.1	12.11 - 22.49			(mg/kg)
Chromium	71.8	76	A		-5.5	53.20 - 98.80			(mg/kg)
Lead	28.3	38.1	W		-25.7	26.67 - 49.53			(mg/kg)
Nickel	22.7	24	A		-5.4	16.80 - 31.20			(mg/kg)
Selenium	16.0	18.5	A		-13.5	12.95 - 24.05			(mg/kg)
Silver	53.2	55.5	A		-4.1	38.85 - 72.15			(mg/kg)
Thallium	41.6	46.3	A		-10.2	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	49.1	53.9	A		-8.9	37.73 - 70.07			(mg/kg)
Zinc	74.5	74.5	A		0.0	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SIMALABS INTERNATIONAL
RECC01 6954 Cornell Rd. Suite 300

Cincinnati OH 45242

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	208	236.8	A		-0.1	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	157	214.2	A		-0.2	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	52.6	26.6	A		1.1	QL - 95.57	(ug/kg)
t-butylbenzene	161	107.4	A		0.5	QL - 415.31	(ug/kg)
Toluene	12.1	18.3	A		-0.4	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	66.6	64.8	A		0.1	QL - 133.51	(ug/kg)
Tetrachloroethene	115	114.2	A		0.0	QL - 356.01	(ug/kg)
n-butylbenzene	103	78.6	A		0.3	QL - 299.81	(ug/kg)
Ethylbenzene	122	130.3	A		-0.1	QL - 420.60	(ug/kg)
m & p-Xylene	137	153.7	A		-0.1	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	827	972	A		-0.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	238	251.2	A		-0.1	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	255	266.4	A		-0.1	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	228	354.6	A		-1.2	33.88 - 675.26	(ug/kg)
Naphthalene	311	398.4	A		-0.7	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	360	386.8	A		-0.3	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	427	436.4	A		-0.1	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	488	431.9	A		0.5	61.10 - 802.70	(ug/kg)
Diethylphthalate	465	459.6	A		0.0	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	374	369.9	A		0.0	63.91 - 675.97	(ug/kg)
Phenanthrene	538	494.4	A		0.3	95.33 - 893.50	(ug/kg)
Anthracene	422	382.7	A		0.3	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Di-n-butylphthalate	581						(ug/kg)
Pyrene	493	465	A		0.2	QL - 937.81	(ug/kg)
Benzo(a)anthracene	511	464	A		0.3	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	3490	2957	A		0.4	QL - 6706.45	(ug/kg)

- Flags:** A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RFETS SSOC Radiological Labs
ROCK01 10808 Hwy 93 Unit B

Golden CO 80403

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	69.61	70	A		-0.6	49.00 - 91.00			(mg/kg)
Barium	291.70	300	A		-2.8	210.00 - 390.00			(mg/kg)
Beryllium	0.86		A						(mg/kg)
Cadmium	16.61	17.3	A		-4.0	12.11 - 22.49			(mg/kg)
Chromium	74.29	76	A		-2.3	53.20 - 98.80			(mg/kg)
Lead	34.26	38.1	A		-10.1	26.67 - 49.53			(mg/kg)
Nickel	23.30	24	A		-2.9	16.80 - 31.20			(mg/kg)
Selenium	26.23	18.5	N		41.8	12.95 - 24.05			(mg/kg)
Silver	51.79	55.5	A		-6.7	38.85 - 72.15			(mg/kg)
Thallium	43.36	46.3	A		-6.3	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	50.20	53.9	A		-6.9	37.73 - 70.07			(mg/kg)
Zinc	76.90	74.5	A		3.2	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RFETS SSOC Radiological Labs
ROCK01 10808 Hwy 93 Unit B

Golden CO 80403

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RSIR99 Instituto de Radioprotecao e Dosimetria
Avenida Salvador Allende S/no.

Rio de Janeiro Rio de Ja 22780

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	81.222	72.1	A	Total Metal	12.7	50.47 - 93.73	1.738	L	(mg/kg)
Barium	862.110	861	A	Total Metal	0.1	602.70 - 1119.30	7.977	L	(mg/kg)
Beryllium	NR								
Cadmium	18.790	17.3	A		8.6	12.11 - 22.49	0.342	L	(mg/kg)
Chromium	125.782	125	A	Total Metal	0.6	87.50 - 162.50	2.866	L	(mg/kg)
Lead	44.508	42.4	A	Total Metal	5.0	29.68 - 55.12	0.651	L	(mg/kg)
Nickel	32.428	28.9	A	Total Metal	12.2	20.23 - 37.57	0.439	L	(mg/kg)
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	51.587	46.3	A		11.4	32.41 - 60.19	1.043	L	(mg/kg)
Uranium-Total	17.166	18.5	A		-7.2	12.95 - 24.05	0.324		(mg/kg)
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	116.545	110	A	Total Metal	5.9	77.00 - 143.00	0.922	L	(mg/kg)
Zinc	100.887	91	A	Total Metal	10.9	63.70 - 118.30	1.175	L	(mg/kg)
Americium-241	71.333	43.5	N		64.0	30.45 - 56.55	4.859		(Bq/kg)
Cesium-134	838.200	862	A		-2.8	603.40 - 1120.60	49.728		(Bq/kg)
Cesium-137	113.800	111	A		2.5	77.70 - 144.30	7.132		(Bq/kg)
Cobalt-57	211.867	246	A		-13.9	172.20 - 319.80	12.660		(Bq/kg)
Cobalt-60	96.733	87.5	A		10.6	61.25 - 113.75	4.858		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	592.467	546	A		8.5	382.20 - 709.80	35.893		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	29.600	33.3	A		-11.1	23.31 - 43.29	1.864		(Bq/kg)
Plutonium-239/240	60.033	72.9	A		-17.6	51.03 - 94.77	3.552		(Bq/kg)
Potassium-40	648.900	652	A		-0.5	456.40 - 847.60	41.745		(Bq/kg)
Strontium-90	14.90		N	False Positive			3.091		(Bq/kg)
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	887.033	809	A		9.6	566.30 - 1051.70	53.101		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

RSIR99 Instituto de Radioprotecão e Dosimetria
Avenida Salvador Allende S/no.

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags: A = Result acceptable Z-score <=2.0)

W = Result acceptable with warning $2.0 < Z\text{-score} \leq 3.0$)

N = Result not acceptable Z-score > 3.0)

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

WSRC/SAVANNAH RIVER TECHNOLOGY CENTER/A
SAVA01 773-A, room B125

AIKEN SC 29802

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	7.64E+02	862	A		-11.4	603.40 - 1120.60	7.32E+00	L	(Bq/kg)
Cesium-137	1.06E+02	111	A		-4.5	77.70 - 144.30	2.09E+00	L	(Bq/kg)
Cobalt-57	2.32E+02	246	A		-5.7	172.20 - 319.80	4.29E+00	L	(Bq/kg)
Cobalt-60	9.29E+01	87.5	A		6.2	61.25 - 113.75	1.17E+00	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	5.61E+02	546	A		2.7	382.20 - 709.80	6.97E+00	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	6.35E+02	652	A		-2.6	456.40 - 847.60	1.50E+01	L	(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	8.71E+02	809	A		7.7	566.30 - 1051.70	1.44E+01	L	(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

WSRC/SAVANNAH RIVER TECHNOLOGY CENTER/A
SAVA01 773-A, room B125

AIKEN SC 29802

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Sanford Cohen and Associates, Inc.
SCAL01
 1000 Monticello Court

Montgomery AL 36117

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	37.0	43.5	A		-14.9	30.45 - 56.55	4.77		(Bq/kg)
Cesium-134	735	862	A		-14.7	603.40 - 1120.60	54.2		(Bq/kg)
Cesium-137	105	111	A		-5.4	77.70 - 144.30	8.27		(Bq/kg)
Cobalt-57	255	246	A		3.7	172.20 - 319.80	17.1		(Bq/kg)
Cobalt-60	97.5	87.5	A		11.4	61.25 - 113.75	7.10		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	588	546	A		7.7	382.20 - 709.80	45.0		(Bq/kg)
Nickel-63	1081	1180	A		-8.4	826.00 - 1534.00	119		(Bq/kg)
Plutonium-238	33.8	33.3	A		1.5	23.31 - 43.29	4.27		(Bq/kg)
Plutonium-239/240	71.2	72.9	A		-2.3	51.03 - 94.77	8.36		(Bq/kg)
Potassium-40	692	652	A		6.1	456.40 - 847.60	51.5		(Bq/kg)
Strontium-90	-1.14		A				0.962		(Bq/kg)
Uranium-234/233	206	229	A		-10.0	160.30 - 297.70	22.3		(Bq/kg)
Uranium-238	208	220	A		-5.5	154.00 - 286.00	22.5		(Bq/kg)
Zinc-65	911	809	A		12.6	566.30 - 1051.70	65.0		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Sanford Cohen and Associates, Inc.
SCAL01
 1000 Monticello Court

Montgomery AL 36117

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Saxton Nuclear Experimental Corp
SNEC01 165 Power Plant Road

Saxton PA 16678

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	663.5	862	W		-23.0	603.40 - 1120.60	16.43	L	(Bq/kg)
Cesium-137	100.88	111	A		-9.1	77.70 - 144.30	5.46		(Bq/kg)
Cobalt-57	216.55	246	A		-12.0	172.20 - 319.80	9.88		(Bq/kg)
Cobalt-60	88.95	87.5	A		1.7	61.25 - 113.75	2.95		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	527.52	546	A		-3.4	382.20 - 709.80	28.31		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	600.51	652	A		-7.9	456.40 - 847.60	29.31		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Saxton Nuclear Experimental Corp
SNEC01 165 Power Plant Road

Saxton PA 16678

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SOUT01 Southwest Research Institute
6220 Culebra Rd.

San Antonio TX 78228

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	71.2	70	A		1.7	49.00 - 91.00	3.7		(mg/kg)
Barium	288	300	A		-4.0	210.00 - 390.00	15		(mg/kg)
Beryllium	NR								
Cadmium	17.3	17.3	A		0.0	12.11 - 22.49	0.9		(mg/kg)
Chromium	66.7	76	A		-12.2	53.20 - 98.80	3.5		(mg/kg)
Lead	35.5	38.1	A		-6.8	26.67 - 49.53	1.8		(mg/kg)
Nickel	19.9	24	A		-17.1	16.80 - 31.20	1.0		(mg/kg)
Selenium	16.8	18.5	A		-9.2	12.95 - 24.05	0.9		(mg/kg)
Silver	53.5	55.5	A		-3.6	38.85 - 72.15	2.8		(mg/kg)
Thallium	44.5	46.3	A		-3.9	32.41 - 60.19	2.3		(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	42.6	53.9	W		-21.0	37.73 - 70.07	2.2		(mg/kg)
Zinc	54.3	74.5	W		-27.1	52.15 - 96.85	2.8		(mg/kg)
Americium-241	52.91	43.5	W		21.6	30.45 - 56.55	7.289		(Bq/kg)
Cesium-134	960.9	862	A		11.5	603.40 - 1120.60	52.54		(Bq/kg)
Cesium-137	128.3	111	A		15.6	77.70 - 144.30	12.54		(Bq/kg)
Cobalt-57	319.4	246	W		29.8	172.20 - 319.80	34.26		(Bq/kg)
Cobalt-60	115.4	87.5	N		31.9	61.25 - 113.75	7.844		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	683.8	546	W		25.2	382.20 - 709.80	67.34		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	32.83	33.3	A		-1.4	23.31 - 43.29	19.04	H	(Bq/kg)
Plutonium-239/240	73.70	72.9	A		1.1	51.03 - 94.77	27.62	H	(Bq/kg)
Potassium-40	817.7	652	W		25.4	456.40 - 847.60	91.76		(Bq/kg)
Strontium-90	NR								
Uranium-234/233	188.4	229	A		-17.7	160.30 - 297.70	38.63	H	(Bq/kg)
Uranium-238	219.0	220	A		-0.5	154.00 - 286.00	42.22		(Bq/kg)
Zinc-65	1074	809	N		32.8	566.30 - 1051.70	98.05		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SOUT01 Southwest Research Institute
6220 Culebra Rd.

San Antonio TX 78228

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	540	236.8	A		1.2	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	750	214.2	W		2.1	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	770	107.4	W		6.5	QL - 415.31	(ug/kg)
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	67	64.8	A		0.1	QL - 133.51	(ug/kg)
Tetrachloroethene	200	114.2	A		1.1	QL - 356.01	(ug/kg)
n-butylbenzene	980	78.6	W		12.2	QL - 299.81	(ug/kg)
Ethylbenzene	220	130.3	A		0.9	QL - 420.60	(ug/kg)
m & p-Xylene	270	153.7	A		1.0	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1100	972	A		0.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	153	251.2	A		-1.0	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	175	266.4	A		-1.0	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	236	354.6	A		-1.1	33.88 - 675.26	(ug/kg)
Naphthalene	263	398.4	A		-1.2	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	75	167	A		-1.6	QL - 344.31	(ug/kg)
2-Chloronaphthalene	247	386.8	A		-1.6	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	325	436.4	A		-0.8	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	371	431.9	A		-0.5	61.10 - 802.70	(ug/kg)
Diethylphthalate	349	459.6	A		-1.0	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	284	369.9	A		-0.8	63.91 - 675.97	(ug/kg)
Phenanthrene	385	494.4	A		-0.8	95.33 - 893.50	(ug/kg)
Anthracene	254	382.7	A		-1.1	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	309	290.5	A		0.2	QL - 596.80	(ug/kg)
1,3-Dinitrobenzene	295	311.9	A		-0.1	QL - 688.44	(ug/kg)
Pentachlorobenzene	288	364	A		-0.6	QL - 764.35	(ug/kg)
Pyrene	323	465	A		-0.9	QL - 937.81	(ug/kg)
Benzo(a)anthracene	285	464	A		-1.1	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2085	2957	A		-0.7	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score ≤ 2.0
 W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
SWOL01 1700 WEST ALBANY

BROKEN ARROW OK 74012

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	67.9	70	A		-3.0	49.00 - 91.00			(mg/kg)
Barium	289	300	A		-3.7	210.00 - 390.00			(mg/kg)
Beryllium	0.86		A						(mg/kg)
Cadmium	16.3	17.3	A		-5.8	12.11 - 22.49			(mg/kg)
Chromium	72.0	76	A		-5.3	53.20 - 98.80			(mg/kg)
Lead	35.2	38.1	A		-7.6	26.67 - 49.53			(mg/kg)
Nickel	22.8	24	A		-5.0	16.80 - 31.20			(mg/kg)
Selenium	17.2	18.5	A		-7.0	12.95 - 24.05			(mg/kg)
Silver	54.2	55.5	A		-2.3	38.85 - 72.15			(mg/kg)
Thallium	43.9	46.3	A		-5.2	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	49.8	53.9	A		-7.6	37.73 - 70.07			(mg/kg)
Zinc	72.4	74.5	A		-2.8	52.15 - 96.85			(mg/kg)
Americium-241	43.7	43.5	A		0.5	30.45 - 56.55	3.8		(Bq/kg)
Cesium-134	755	862	A		-12.4	603.40 - 1120.60	25.9		(Bq/kg)
Cesium-137	103	111	A		-7.2	77.70 - 144.30	3.7		(Bq/kg)
Cobalt-57	237	246	A		-3.7	172.20 - 319.80	11.1		(Bq/kg)
Cobalt-60	95.1	87.5	A		8.7	61.25 - 113.75	2.2	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	581	546	A		6.4	382.20 - 709.80	18.5		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	36.2	33.3	A		8.7	23.31 - 43.29	3.6		(Bq/kg)
Plutonium-239/240	71.0	72.9	A		-2.6	51.03 - 94.77	15.1	H	(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	213	229	A		-7.0	160.30 - 297.70	22.1		(Bq/kg)
Uranium-238	222	220	A		0.9	154.00 - 286.00	20.7		(Bq/kg)
Zinc-65	877	809	A		8.4	566.30 - 1051.70	27		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
SWOL01 1700 WEST ALBANY

BROKEN ARROW OK 74012

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	152	214.2	A		-0.2	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	10.3	26.6	A		-0.7	QL - 95.57	(ug/kg)
t-butylbenzene	96.0	107.4	A		-0.1	QL - 415.31	(ug/kg)
Toluene	14.2	18.3	A		-0.3	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	53.3	64.8	A		-0.5	QL - 133.51	(ug/kg)
Tetrachloroethene	68.6	114.2	A		-0.6	QL - 356.01	(ug/kg)
n-butylbenzene	67.9	78.6	A		-0.1	QL - 299.81	(ug/kg)
Ethylbenzene	94.9	130.3	A		-0.4	QL - 420.60	(ug/kg)
m & p-Xylene	112	153.7	A		-0.4	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1430	972	A		0.9	QL - 2497.60	(ug/kg)
Phenol	19.2						(ug/kg)
1,3-Dichlorobenzene	239	251.2	A		-0.1	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	247	266.4	A		-0.2	QL - 544.41	(ug/kg)
Nitrobenzene	17.1						(ug/kg)
1,2,4-Trichlorobenzene	391	354.6	A		0.3	33.88 - 675.26	(ug/kg)
Naphthalene	406	398.4	A		0.1	45.71 - 751.21	(ug/kg)
4-Chloro-3-methylphenol	25.1						(ug/kg)
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	342	386.8	A		-0.5	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	411	436.4	A		-0.2	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	440	431.9	A		0.1	61.10 - 802.70	(ug/kg)
4-Nitrophenol	20.5						(ug/kg)
Diethylphthalate	446	459.6	A		-0.1	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	366	369.9	A		0.0	63.91 - 675.97	(ug/kg)
Pentachlorophenol	21.8						(ug/kg)
Phenanthrene	452	494.4	A		-0.3	95.33 - 893.50	(ug/kg)
Anthracene	408	382.7	A		0.2	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Di-n-butylphthalate	28.4						(ug/kg)
Pyrene	438	465	A		-0.2	QL - 937.81	(ug/kg)
Benzo(a)anthracene	439	464	A		-0.2	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2360	2957	A		-0.5	QL - 6706.45	(ug/kg)

- Flags:**
- A = Result acceptable Z-score ≤ 2.0
 - W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 - N = Result not acceptable Z-score > 3.0
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

TELEDYNE BROWN ENGINEERING - ENVIRONMENT
TELE01 2508 Quality Lane

Knoxville TN 37931

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	44.2	43.5	A		1.6	30.45 - 56.55	6.64		(Bq/kg)
Cesium-134	948	862	A		10.0	603.40 - 1120.60	7.93	L	(Bq/kg)
Cesium-137	131	111	A		18.0	77.70 - 144.30	2.37	L	(Bq/kg)
Cobalt-57	289	246	A		17.5	172.20 - 319.80	4.86	L	(Bq/kg)
Cobalt-60	109	87.5	W		24.6	61.25 - 113.75	1.6	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	679	546	W		24.4	382.20 - 709.80	8.49	L	(Bq/kg)
Nickel-63	1010	1180	A		-14.4	826.00 - 1534.00	60.7		(Bq/kg)
Plutonium-238	30.65	33.3	A		-8.0	23.31 - 43.29	6.35	H	(Bq/kg)
Plutonium-239/240	71.9	72.9	A		-1.4	51.03 - 94.77	12.4		(Bq/kg)
Potassium-40	722	652	A		10.7	456.40 - 847.60	19.7	L	(Bq/kg)
Radium-226	268						20.4		(Bq/kg)
Strontium-90	1.25		A				.92		(Bq/kg)
Uranium-234/233	231	229	A		0.9	160.30 - 297.70	59.5	H	(Bq/kg)
Uranium-238	234	220	A		6.4	154.00 - 286.00	59.9	H	(Bq/kg)
Zinc-65	1020	809	W		26.1	566.30 - 1051.70	14.7	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

TELEDYNE BROWN ENGINEERING - ENVIRONMENT
TELE01 2508 Quality Lane

Knoxville TN 37931

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Environmental, Inc., Midwest Lab
TELE02
 700 Landwehr Road

Northbrook IL 60062

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	40.540	43.5	A		-6.8	30.45 - 56.55	2.720		(Bq/kg)
Cesium-134	692.556	862	A		-19.7	603.40 - 1120.60	2.088	L	(Bq/kg)
Cesium-137	96.975	111	A		-12.6	77.70 - 144.30	1.671	L	(Bq/kg)
Cobalt-57	210.577	246	A		-14.4	172.20 - 319.80	2.040	L	(Bq/kg)
Cobalt-60	84.380	87.5	A		-3.6	61.25 - 113.75	0.943	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	509.741	546	A		-6.6	382.20 - 709.80	3.433	L	(Bq/kg)
Nickel-63	890.600	1180	W		-24.5	826.00 - 1534.00	22.435	L	(Bq/kg)
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	68.695	72.9	A		-5.8	51.03 - 94.77	3.680		(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	1.543		A				2.971		(Bq/kg)
Uranium-234/233	166.329	229	W		-27.4	160.30 - 297.70	3.806	L	(Bq/kg)
Uranium-238	169.756	220	W		-22.8	154.00 - 286.00	3.841	L	(Bq/kg)
Zinc-65	783.593	809	A		-3.1	566.30 - 1051.70	6.425	L	(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Environmental, Inc., Midwest Lab
TELE02
 700 Landwehr Road

Northbrook IL 60062

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Eberline Services
TMAE01 7021 Pan American N.E.

Albuquerque NM 87109

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	42.7	43.5	A		-1.8	30.45 - 56.55	4.22		(Bq/kg)
Cesium-134	882	862	A		2.3	603.40 - 1120.60	57.0		(Bq/kg)
Cesium-137	121	111	A		9.0	77.70 - 144.30	11.4		(Bq/kg)
Cobalt-57	297	246	W		20.7	172.20 - 319.80	24.6		(Bq/kg)
Cobalt-60	109	87.5	W		24.6	61.25 - 113.75	8.22		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	676	546	W		23.8	382.20 - 709.80	53.2		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	34.2	33.3	A		2.7	23.31 - 43.29	4.34		(Bq/kg)
Plutonium-239/240	73.0	72.9	A		0.1	51.03 - 94.77	7.53		(Bq/kg)
Potassium-40	722	652	A		10.7	456.40 - 847.60	79.8		(Bq/kg)
Strontium-90	0.26		A				9.99		(Bq/kg)
Uranium-234/233	207	229	A		-9.6	160.30 - 297.70	12.3		(Bq/kg)
Uranium-238	210	220	A		-4.5	154.00 - 286.00	12.4		(Bq/kg)
Zinc-65	995	809	W		23.0	566.30 - 1051.70	81.3		(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Eberline Services
TMAE01 7021 Pan American N.E.

Albuquerque NM 87109

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

EBERLINE SERVICES OAK RIDGE LABORATORY
TMAO01 601 SCARBORO RD

OAK RIDGE TN 37830

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	40.456	43.5	A		-7.0	30.45 - 56.55	3.251		(Bq/kg)
Cesium-134	934.73	862	A		8.4	603.40 - 1120.60	29.27		(Bq/kg)
Cesium-137	116.00	111	A		4.5	77.70 - 144.30	8.644		(Bq/kg)
Cobalt-57	251.148	246	A		2.1	172.20 - 319.80	13.888		(Bq/kg)
Cobalt-60	99.179	87.5	A		13.3	61.25 - 113.75	4.164		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	595.79	546	A		9.1	382.20 - 709.80	35.687		(Bq/kg)
Nickel-63	947.22	1180	A		-19.7	826.00 - 1534.00	13.12	L	(Bq/kg)
Plutonium-238	30.335	33.3	A		-8.9	23.31 - 43.29	3.538		(Bq/kg)
Plutonium-239/240	67.61	72.9	A		-7.3	51.03 - 94.77	6.328		(Bq/kg)
Potassium-40	697.45	652	A		7.0	456.40 - 847.60	43.526		(Bq/kg)
Strontium-90	- 1.422		A				2.056		(Bq/kg)
Uranium-234/233	207.45	229	A		-9.4	160.30 - 297.70	20.375		(Bq/kg)
Uranium-238	211.492	220	A		-3.9	154.00 - 286.00	20.734		(Bq/kg)
Zinc-65	934.343	809	A		15.5	566.30 - 1051.70	43.1		(Bq/kg)

- Flags:**
- A = Result acceptable Bias <= 20%
 - W = Result acceptable with warning 20% < Bias <= 30%
 - N = Result not acceptable Bias > 30%
 - L = Uncertainty potentially too low (for information purposes only)
 - H = Uncertainty potentially too high (for information purposes only)
 - QL = Detection Limit
 - RW = Report Warning
 - NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

EBERLINE SERVICES OAK RIDGE LABORATORY
TMAO01 601 SCARBORO RD
 OAK RIDGE TN 37830

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4			45.71 - 751.21		
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4			39.41 - 833.45		
2,4-Dinitrotoluene	NR	431.9			61.10 - 802.70		
Diethylphthalate	NR	459.6			112.77 - 806.53		
Hexachlorobenzene	NR	369.9			63.91 - 675.97		
Phenanthrene	NR	494.4			95.33 - 893.50		
Anthracene	NR	382.7			45.62 - 719.80		
1,4-Dinitrobenzene	NR	290.5			QL - 596.80		
1,3-Dinitrobenzene	NR	311.9			QL - 688.44		
Pentachlorobenzene	NR	364			QL - 764.35		
Pyrene	NR	465			QL - 937.81		
Benzo(a)anthracene	NR	464			QL - 948.00		
Bis(2-ethylhexyl)phthalat	NR	2957			QL - 6706.45		

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

TMAR01 Eberline Services
2030 Wright Ave
Richmond CA 94804

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	33.58	43.5	W		-22.8	30.45 - 56.55	2.15		(Bq/kg)
Cesium-134	850.2	862	A		-1.4	603.40 - 1120.60	35.3		(Bq/kg)
Cesium-137	104.1	111	A		-6.2	77.70 - 144.30	4.6		(Bq/kg)
Cobalt-57	232.0	246	A		-5.7	172.20 - 319.80	3.9	L	(Bq/kg)
Cobalt-60	86.03	87.5	A		-1.7	61.25 - 113.75	4.06		(Bq/kg)
Iron-55	2149	1870	A		14.9	1309.00 - 2431.00	551		(Bq/kg)
Manganese-54	547.1	546	A		0.2	382.20 - 709.80	9.5	L	(Bq/kg)
Nickel-63	1144.1	1180	A		-3.0	826.00 - 1534.00	68.6		(Bq/kg)
Plutonium-238	28.10	33.3	A		-15.6	23.31 - 43.29	1.77		(Bq/kg)
Plutonium-239/240	59.54	72.9	A		-18.3	51.03 - 94.77	3.45		(Bq/kg)
Potassium-40	593.0	652	A		-9.0	456.40 - 847.60	32.9		(Bq/kg)
Strontium-90	-1.429		A				2.411		(Bq/kg)
Uranium-234/233	200.8	229	A		-12.3	160.30 - 297.70	10.6		(Bq/kg)
Uranium-238	200.3	220	A		-9.0	154.00 - 286.00	10.6		(Bq/kg)
Zinc-65	846.9	809	A		4.7	566.30 - 1051.70	21.2	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Eberline Services
TMAR01 2030 Wright Ave
 Richmond CA 94804

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FUSRAP
TNUT01 8945 LATTY AVE
 BERKELEY MO 63134

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	745.61	862	A		-13.5	603.40 - 1120.60	5.83	L	(Bq/kg)
Cesium-137	113.69	111	A		2.4	77.70 - 144.30	2.05	L	(Bq/kg)
Cobalt-57	259.60	246	A		5.5	172.20 - 319.80	3.42	L	(Bq/kg)
Cobalt-60	99.91	87.5	A		14.2	61.25 - 113.75	1.18	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	609.56	546	A		11.6	382.20 - 709.80	8.35	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	702.16	652	A		7.7	456.40 - 847.60	12.77	L	(Bq/kg)
Strontium-90	NR								
Uranium-234/233	212.22	229	A		-7.3	160.30 - 297.70	30.533		(Bq/kg)
Uranium-238	211.98	220	A		-3.6	154.00 - 286.00	30.366		(Bq/kg)
Zinc-65	942.46	809	A		16.5	566.30 - 1051.70	12.90	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FUSRAP
TNUT01 8945 LATTY AVE
 BERKELEY MO 63134

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8			127.18 - 646.34		
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAB.RADIACTIVIDAD AMBIENTAL. UNIV. POLITECNIC
UPVL99 CAMINO DE VERA, 14
 VALENCIA VALENCI 46022

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	46.5	43.5	A		6.9	30.45 - 56.55	1.0	L	(Bq/kg)
Cesium-134	802	862	A		-7.0	603.40 - 1120.60	10	L	(Bq/kg)
Cesium-137	109.5	111	A		-1.4	77.70 - 144.30	1.5	L	(Bq/kg)
Cobalt-57	249	246	A		1.2	172.20 - 319.80	3	L	(Bq/kg)
Cobalt-60	95.5	87.5	A		9.1	61.25 - 113.75	1.5	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	581	546	A		6.4	382.20 - 709.80	7	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	25.45	33.3	W		-23.6	23.31 - 43.29	0.45	L	(Bq/kg)
Plutonium-239/240	62.6	72.9	A		-14.1	51.03 - 94.77	1.0	L	(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	0.57		N	False Positive			0.09		(Bq/kg)
Uranium-234/233	181.1	229	W		-20.9	160.30 - 297.70	5.4	L	(Bq/kg)
Uranium-238	186.4	220	A		-15.3	154.00 - 286.00	5.5	L	(Bq/kg)
Zinc-65	900	809	A		11.2	566.30 - 1051.70	12	L	(Bq/kg)

- Flags:** A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

LAB.RADIACTIVIDAD AMBIENTAL. UNIV. POLITECNIC
UPVL99 CAMINO DE VERA, 14
 VALENCIA VALENCI 46022

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

WEST01 Lionville Laboratory Incorporated
208 Welsh Pool Road

Lionville PA 19341

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	71.8	70	A		2.6	49.00 - 91.00			(mg/kg)
Barium	298	300	A		-0.7	210.00 - 390.00			(mg/kg)
Beryllium	0.93		A						(mg/kg)
Cadmium	16.7	17.3	A		-3.5	12.11 - 22.49			(mg/kg)
Chromium	78.2	76	A		2.9	53.20 - 98.80			(mg/kg)
Lead	37.9	38.1	A		-0.5	26.67 - 49.53			(mg/kg)
Nickel	24.8	24	A		3.3	16.80 - 31.20			(mg/kg)
Selenium	19.1	18.5	A		3.2	12.95 - 24.05			(mg/kg)
Silver	55.1	55.5	A		-0.7	38.85 - 72.15			(mg/kg)
Thallium	44.7	46.3	A		-3.5	32.41 - 60.19			(mg/kg)
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	57.1	53.9	A		5.9	37.73 - 70.07			(mg/kg)
Zinc	77.1	74.5	A		3.5	52.15 - 96.85			(mg/kg)
Americium-241	NR	43.5				30.45 - 56.55			
Cesium-134	NR	862				603.40 - 1120.60			
Cesium-137	NR	111				77.70 - 144.30			
Cobalt-57	NR	246				172.20 - 319.80			
Cobalt-60	NR	87.5				61.25 - 113.75			
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	NR	546				382.20 - 709.80			
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	NR	33.3				23.31 - 43.29			
Plutonium-239/240	NR	72.9				51.03 - 94.77			
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	NR	809				566.30 - 1051.70			

Flags: A = Result acceptable Bias <= 20%

W = Result acceptable with warning 20% < Bias <= 30%

N = Result not acceptable Bias > 30%

L = Uncertainty potentially too low (for information purposes only)

H = Uncertainty potentially too high (for information purposes only)

QL = Detection Limit

RW = Report Warning

NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Lionville Laboratory Incorporated
WEST01 208 Welsh Pool Road

Lionville PA 19341

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	180	236.8	A		-0.2	QL - 1017.70	(ug/kg)
1,2,4-Trimethylbenzene	240	214.2	A		0.1	QL - 975.47	(ug/kg)
Chloroform	NR	4.6					
Trichloroethene	17	26.6	A		-0.4	QL - 95.57	(ug/kg)
t-butylbenzene	160	107.4	A		0.5	QL - 415.31	(ug/kg)
Toluene	19	18.3	A		0.0	QL - 61.94	(ug/kg)
1,1,2-Trichloroethane	74	64.8	A		0.4	QL - 133.51	(ug/kg)
Tetrachloroethene	110	114.2	A		-0.1	QL - 356.01	(ug/kg)
n-butylbenzene	110	78.6	A		0.4	QL - 299.81	(ug/kg)
Ethylbenzene	130	130.3	A		0.0	QL - 420.60	(ug/kg)
m & p-Xylene	160	153.7	A		0.1	QL - 508.80	(ug/kg)
1,1,2,2-Tetrachloroethane	1100	972	A		0.3	QL - 2497.60	(ug/kg)
1,3-Dichlorobenzene	220	251.2	A		-0.3	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	240	266.4	A		-0.3	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	340	354.6	A		-0.1	33.88 - 675.26	(ug/kg)
Naphthalene	390	398.4	A		-0.1	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	210	167	A		0.7	QL - 344.31	(ug/kg)
2-Chloronaphthalene	350	386.8	A		-0.4	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	400	436.4	A		-0.3	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	420	431.9	A		-0.1	61.10 - 802.70	(ug/kg)
Diethylphthalate	380	459.6	A		-0.7	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	290	369.9	A		-0.8	63.91 - 675.97	(ug/kg)
Phenanthrene	400	494.4	A		-0.7	95.33 - 893.50	(ug/kg)
Anthracene	320	382.7	A		-0.6	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	350	311.9	A		0.3	QL - 688.44	(ug/kg)
Pentachlorobenzene	300	364	A		-0.5	QL - 764.35	(ug/kg)
Pyrene	460	465	A		0.0	QL - 937.81	(ug/kg)
Benzo(a)anthracene	420	464	A		-0.3	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	2700	2957	A		-0.2	QL - 6706.45	(ug/kg)

- Flags:** A = Result acceptable Z-score ≤ 2.0
 W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Waste Sampling and Characterization Facility
WEST03 PO Box 1000, S3-30

Richland WA 99352

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	77.1	70	A		10.1	49.00 - 91.00	20.8	H	(mg/kg)
Barium	288	300	A		-4.0	210.00 - 390.00	104	H	(mg/kg)
Beryllium	NR								
Cadmium	17.7	17.3	A		2.3	12.11 - 22.49	4.2	H	(mg/kg)
Chromium	78.8	76	A		3.7	53.20 - 98.80	26.0	H	(mg/kg)
Lead	35.0	38.1	A		-8.1	26.67 - 49.53	8.8	H	(mg/kg)
Nickel	23.0	24	A		-4.2	16.80 - 31.20	6.9	H	(mg/kg)
Selenium	46.5	18.5	N		151.4	12.95 - 24.05	20.5	H	(mg/kg)
Silver	51.5	55.5	A		-7.2	38.85 - 72.15	15.5	H	(mg/kg)
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	57.5	53.9	A		6.7	37.73 - 70.07	23.0	H	(mg/kg)
Zinc	83.2	74.5	A		11.7	52.15 - 96.85	19.1	H	(mg/kg)
Americium-241	41.2	43.5	A		-5.3	30.45 - 56.55	5		(Bq/kg)
Cesium-134	600	862	N		-30.4	603.40 - 1120.60	39.6		(Bq/kg)
Cesium-137	111	111	A		0.0	77.70 - 144.30	17.1		(Bq/kg)
Cobalt-57	238	246	A		-3.3	172.20 - 319.80	21.9		(Bq/kg)
Cobalt-60	97.1	87.5	A		11.0	61.25 - 113.75	8.0		(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	606	546	A		11.0	382.20 - 709.80	91.1		(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	33.3	33.3	A		0.0	23.31 - 43.29	3.3		(Bq/kg)
Plutonium-239/240	69.0	72.9	A		-5.3	51.03 - 94.77	6.4		(Bq/kg)
Potassium-40	NR	652				456.40 - 847.60			
Strontium-90	NR								
Uranium-234/233	198	229	A		-13.5	160.30 - 297.70	19		(Bq/kg)
Uranium-238	202	220	A		-8.2	154.00 - 286.00	19.3		(Bq/kg)
Zinc-65	955	809	A		18.0	566.30 - 1051.70	114		(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Waste Sampling and Characterization Facility
WEST03 PO Box 1000, S3-30

Richland WA 99352

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	380	251.2	A		1.3	QL - 539.81	(ug/kg)
1,2-Dichlorobenzene	320	266.4	A		0.6	QL - 544.41	(ug/kg)
1,2,4-Trichlorobenzene	500	354.6	A		1.4	33.88 - 675.26	(ug/kg)
Naphthalene	530	398.4	A		1.1	45.71 - 751.21	(ug/kg)
2,6-Dichlorophenol	220	167	A		0.9	QL - 344.31	(ug/kg)
2-Chloronaphthalene	500	386.8	A		1.3	127.18 - 646.34	(ug/kg)
2,6-Dinitrotoluene	510	436.4	A		0.6	39.41 - 833.45	(ug/kg)
2,4-Dinitrotoluene	500	431.9	A		0.6	61.10 - 802.70	(ug/kg)
Diethylphthalate	700	459.6	W		2.1	112.77 - 806.53	(ug/kg)
Hexachlorobenzene	520	369.9	A		1.5	63.91 - 675.97	(ug/kg)
Phenanthrene	590	494.4	A		0.7	95.33 - 893.50	(ug/kg)
Anthracene	460	382.7	A		0.7	45.62 - 719.80	(ug/kg)
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	510	465	A		0.3	QL - 937.81	(ug/kg)
Benzo(a)anthracene	470	464	A		0.0	QL - 948.00	(ug/kg)
Bis(2-ethylhexyl)phthalat	5600	2957	W		2.1	QL - 6706.45	(ug/kg)

Flags: A = Result acceptable Z-score <=2.0
 W = Result acceptable with warning 2.0 < Z-score <=3.0
 N = Result not acceptable Z-score > 3.0
 L = Uncertainty potentially too low (for infomation purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Pace Analytical Services, Inc - WALTZ MILL SITE
WEST04 P.O. BOX 158
 MADISON PA 15663

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	41.4	43.5	A		-4.8	30.45 - 56.55	4.32		(Bq/kg)
Cesium-134	760	862	A		-11.8	603.40 - 1120.60	11.6	L	(Bq/kg)
Cesium-137	112	111	A		0.9	77.70 - 144.30	2.85	L	(Bq/kg)
Cobalt-57	251	246	A		2.0	172.20 - 319.80	5.74	L	(Bq/kg)
Cobalt-60	94.4	87.5	A		7.9	61.25 - 113.75	1.08	L	(Bq/kg)
Iron-55	1096.7	1870	N		-41.3	1309.00 - 2431.00	99.0		(Bq/kg)
Manganese-54	599	546	A		9.7	382.20 - 709.80	18.7		(Bq/kg)
Nickel-63	1190.2	1180	A		0.9	826.00 - 1534.00	78.7		(Bq/kg)
Plutonium-238	39.2	33.3	A		17.7	23.31 - 43.29	4.09		(Bq/kg)
Plutonium-239/240	67.6	72.9	A		-7.3	51.03 - 94.77	6.67		(Bq/kg)
Potassium-40	639	652	A		-2.0	456.40 - 847.60	13.5	L	(Bq/kg)
Strontium-90	0.449		A				1.46		(Bq/kg)
Uranium-234/233	202	229	A		-11.8	160.30 - 297.70	17.1		(Bq/kg)
Uranium-238	207	220	A		-5.9	154.00 - 286.00	17.2		(Bq/kg)
Zinc-65	876	809	A		8.3	566.30 - 1051.70	16.4	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

Pace Analytical Services, Inc - WALTZ MILL SITE
WEST04 P.O. BOX 158
 MADISON PA 15663

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FRAMATOME ANP DE&S ENVIRONMENTAL LABORA
YAEC01 29 Research Drive
 Marlborough MA 01581

Analyte	Result	Ref Value	Flag	Flag Text	Bias (%)	Acceptance Range	Unc Value	Unc. Flag	Units
Arsenic	NR	70				49.00 - 91.00			
Barium	NR	300				210.00 - 390.00			
Beryllium	NR								
Cadmium	NR	17.3				12.11 - 22.49			
Chromium	NR	76				53.20 - 98.80			
Lead	NR	38.1				26.67 - 49.53			
Nickel	NR	24				16.80 - 31.20			
Selenium	NR	18.5				12.95 - 24.05			
Silver	NR	55.5				38.85 - 72.15			
Thallium	NR	46.3				32.41 - 60.19			
Uranium-Total	NR	18.5				12.95 - 24.05			
Uranium-235	NR	0.13				0.09 - 0.17			
Uranium-238	NR	18.4				12.88 - 23.92			
Vanadium	NR	53.9				37.73 - 70.07			
Zinc	NR	74.5				52.15 - 96.85			
Americium-241	43.48	43.5	A		0.0	30.45 - 56.55	0.85	L	(Bq/kg)
Cesium-134	929.8	862	A		7.9	603.40 - 1120.60	3.4	L	(Bq/kg)
Cesium-137	113.8	111	A		2.5	77.70 - 144.30	1.3	L	(Bq/kg)
Cobalt-57	258.6	246	A		5.1	172.20 - 319.80	1.6	L	(Bq/kg)
Cobalt-60	96.3	87.5	A		10.1	61.25 - 113.75	1.1	L	(Bq/kg)
Iron-55	NR	1870				1309.00 - 2431.00			
Manganese-54	596.4	546	A		9.2	382.20 - 709.80	6.0	L	(Bq/kg)
Nickel-63	NR	1180				826.00 - 1534.00			
Plutonium-238	34.43	33.3	A		3.4	23.31 - 43.29	.48	L	(Bq/kg)
Plutonium-239/240	73.96	72.9	A		1.5	51.03 - 94.77	.68	L	(Bq/kg)
Potassium-40	661	652	A		1.4	456.40 - 847.60	11	L	(Bq/kg)
Strontium-90	NR								
Uranium-234/233	NR	229				160.30 - 297.70			
Uranium-238	NR	220				154.00 - 286.00			
Zinc-65	878.9	809	A		8.6	566.30 - 1051.70	7.4	L	(Bq/kg)

Flags: A = Result acceptable Bias <= 20%
 W = Result acceptable with warning 20% < Bias <= 30%
 N = Result not acceptable Bias > 30%
 L = Uncertainty potentially too low (for information purposes only)
 H = Uncertainty potentially too high (for information purposes only)
 QL = Detection Limit
 RW = Report Warning
 NR = Not Reported

Mixed Analyte Performance Evaluation Program

Laboratory Results

Sample ID: MAPEP-02-S9

FRAMATOME ANP DE&S ENVIRONMENTAL LABORA
YAEC01 29 Research Drive
 Marlborough MA 01581

Analyte	Result	Ref Value	Flag	Flag Text	Z Score	Acceptance Range	Units
Cumene	NR	236.8				QL - 1017.70	
1,2,4-Trimethylbenzene	NR	214.2				QL - 975.47	
Chloroform	NR	4.6					
Trichloroethene	NR	26.6				QL - 95.57	
t-butylbenzene	NR	107.4				QL - 415.31	
Toluene	NR	18.3				QL - 61.94	
1,1,2-Trichloroethane	NR	64.8				QL - 133.51	
Tetrachloroethene	NR	114.2				QL - 356.01	
n-butylbenzene	NR	78.6				QL - 299.81	
Ethylbenzene	NR	130.3				QL - 420.60	
m & p-Xylene	NR	153.7				QL - 508.80	
1,1,2,2-Tetrachloroethane	NR	972				QL - 2497.60	
1,3-Dichlorobenzene	NR	251.2				QL - 539.81	
1,2-Dichlorobenzene	NR	266.4				QL - 544.41	
1,2,4-Trichlorobenzene	NR	354.6			33.88 - 675.26		
Naphthalene	NR	398.4				45.71 - 751.21	
2,6-Dichlorophenol	NR	167				QL - 344.31	
2-Chloronaphthalene	NR	386.8				127.18 - 646.34	
2,6-Dinitrotoluene	NR	436.4				39.41 - 833.45	
2,4-Dinitrotoluene	NR	431.9				61.10 - 802.70	
Diethylphthalate	NR	459.6				112.77 - 806.53	
Hexachlorobenzene	NR	369.9				63.91 - 675.97	
Phenanthrene	NR	494.4				95.33 - 893.50	
Anthracene	NR	382.7				45.62 - 719.80	
1,4-Dinitrobenzene	NR	290.5				QL - 596.80	
1,3-Dinitrobenzene	NR	311.9				QL - 688.44	
Pentachlorobenzene	NR	364				QL - 764.35	
Pyrene	NR	465				QL - 937.81	
Benzo(a)anthracene	NR	464				QL - 948.00	
Bis(2-ethylhexyl)phthalat	NR	2957				QL - 6706.45	

Flags:

- A = Result acceptable Z-score ≤ 2.0
- W = Result acceptable with warning $2.0 < \text{Z-score} \leq 3.0$
- N = Result not acceptable Z-score > 3.0
- L = Uncertainty potentially too low (for information purposes only)
- H = Uncertainty potentially too high (for information purposes only)
- QL = Detection Limit
- RW = Report Warning
- NR = Not Reported

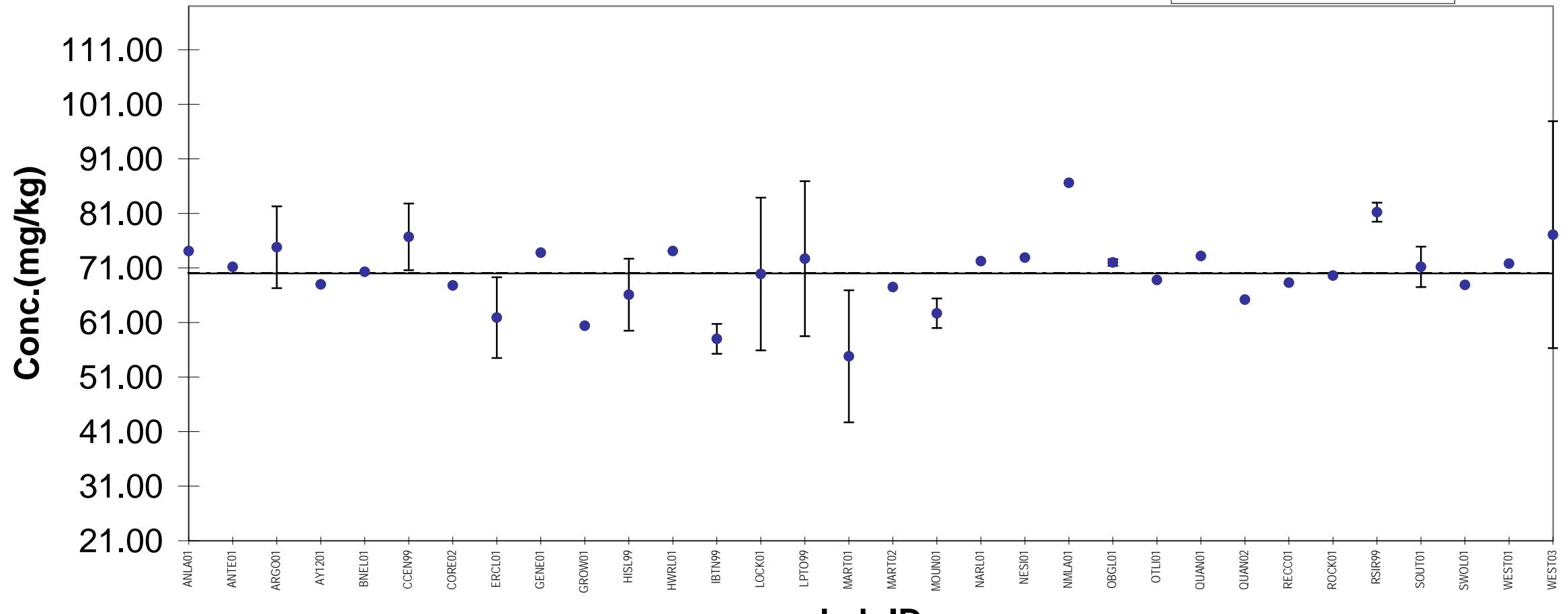
APPENDIX

C

**Graphics of Data Gathered from Soil
Sample MAPEP-02-S9**

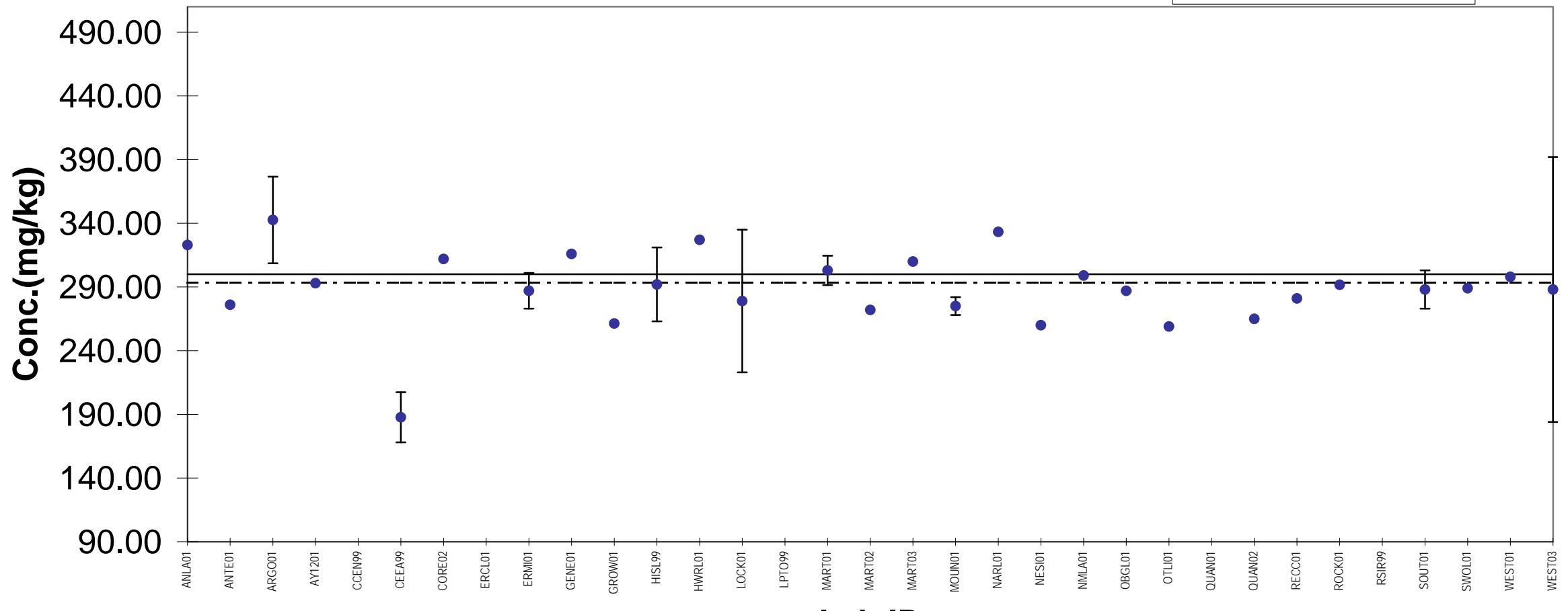
Arsenic MAPEP-02-S9

• Lab Result
— Ref. Value 70
- - - Mean 70.08



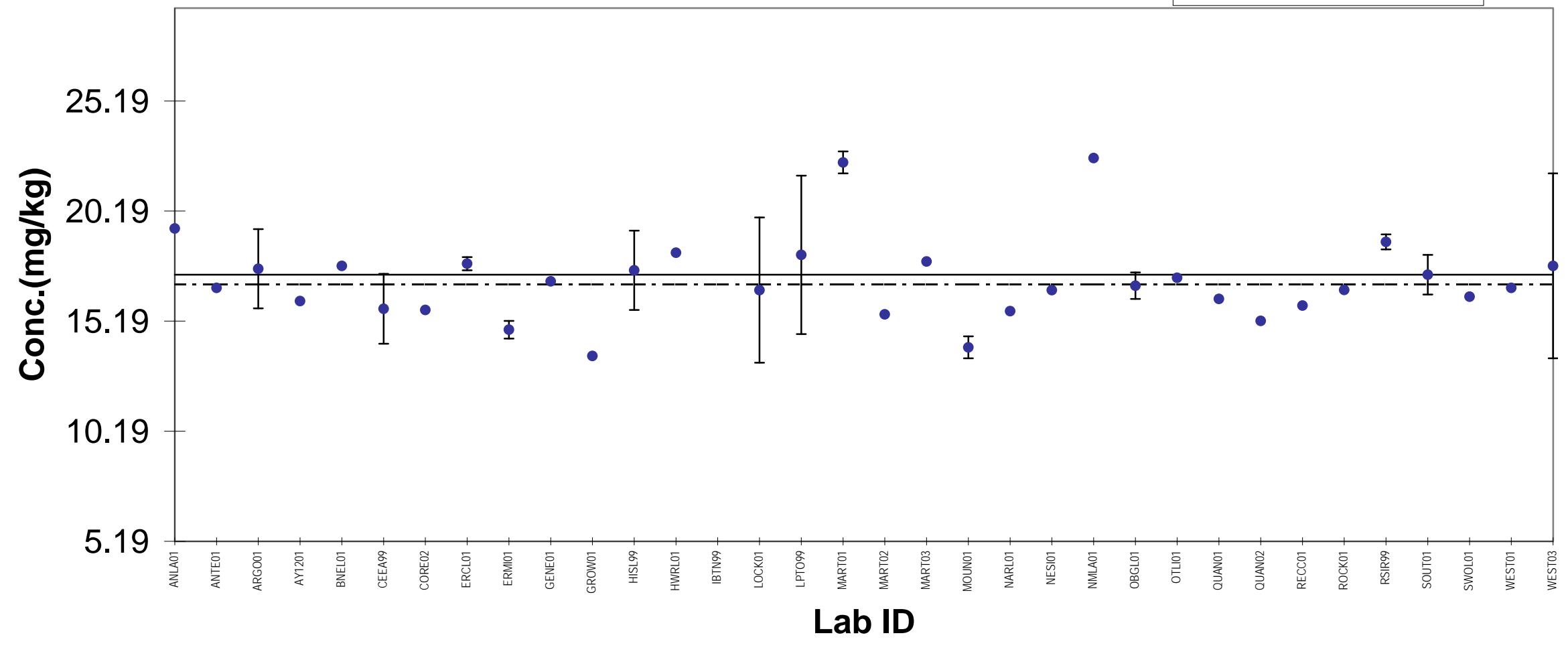
Barium MAPEP-02-S9

• Lab Result
— Ref. Value 300
- - - Mean 293.42



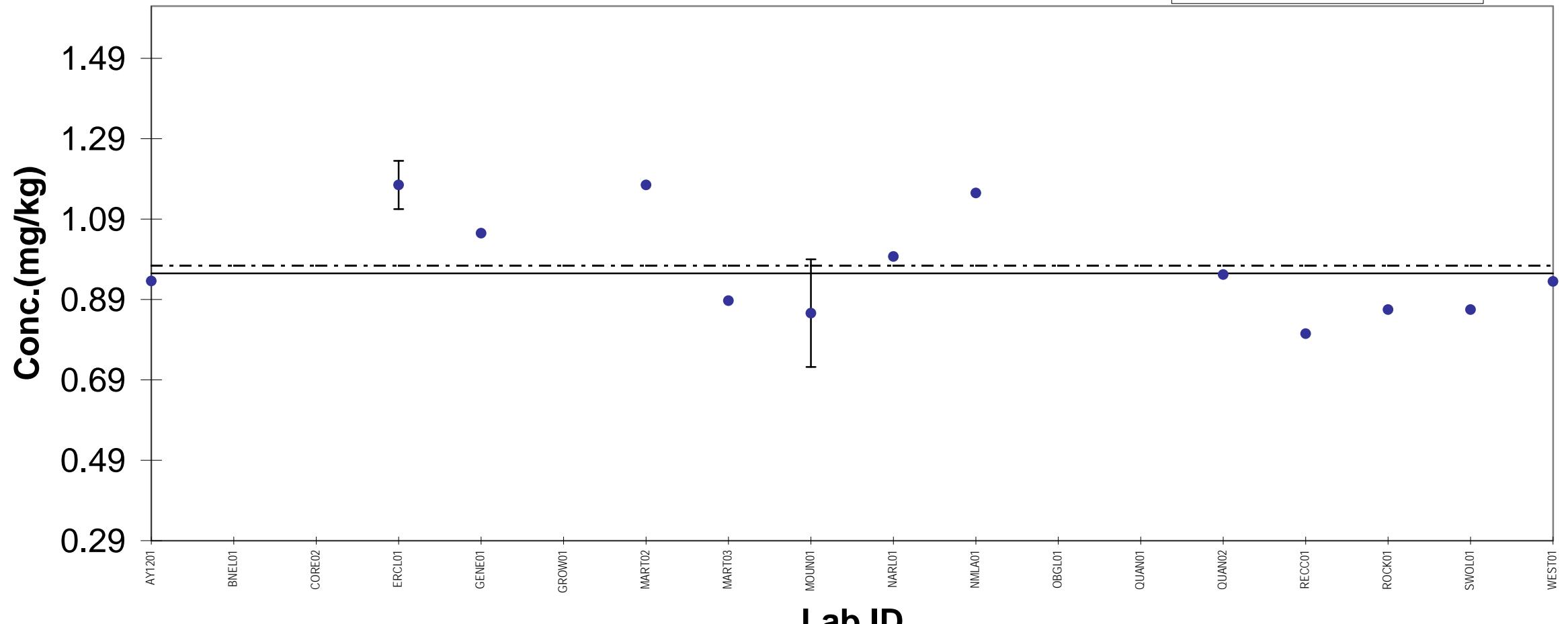
Cadmium MAPEP-02-S9

• Lab Result
— Ref. Value 17.3
- - - Mean 16.85



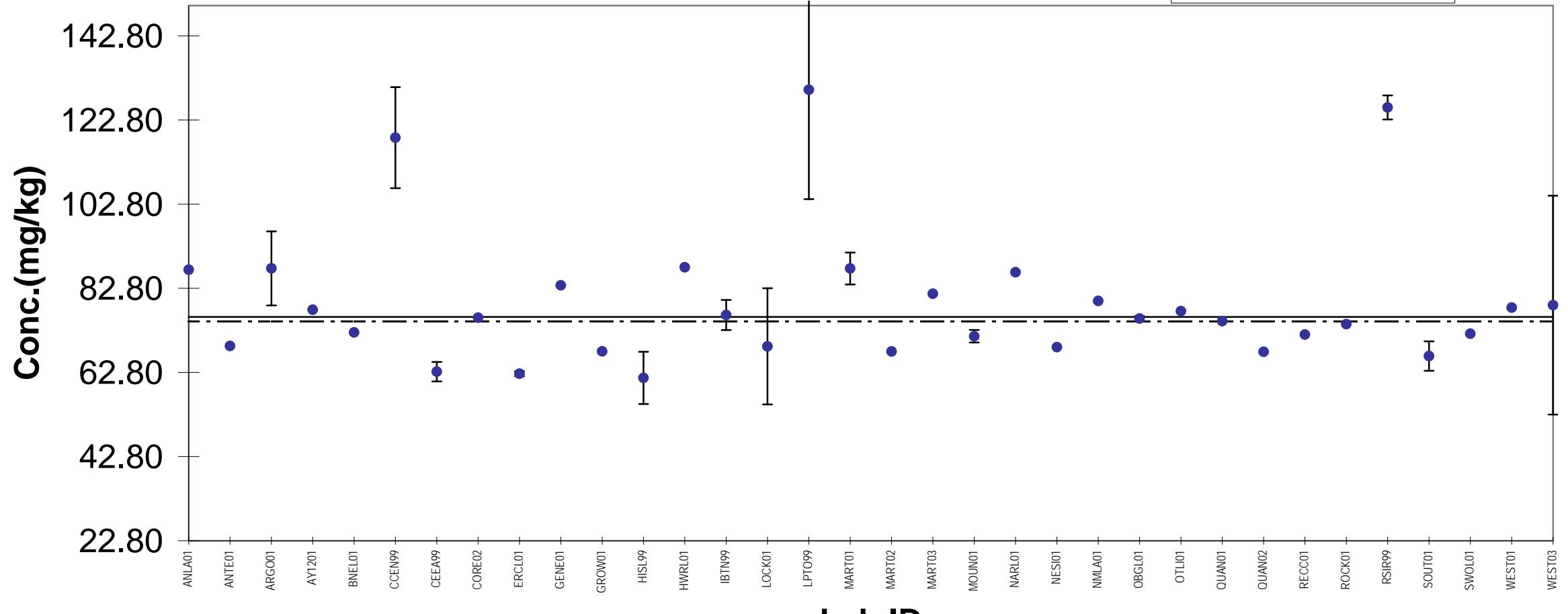
Beryllium MAPEP-02-S9

• Lab Result
— Ref. Value 0.95
- - - Mean 0.96



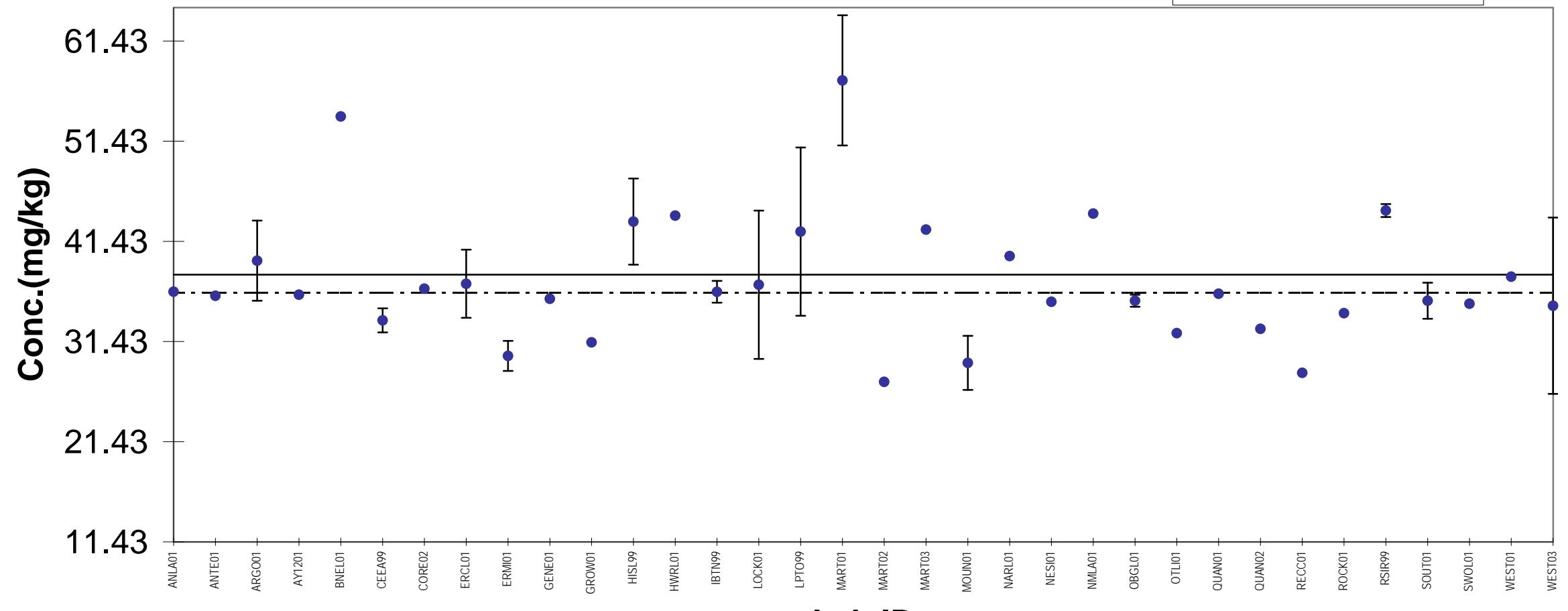
Chromium MAPEP-02-S9

• Lab Result
— Ref. Value 76
- - - Mean 74.9



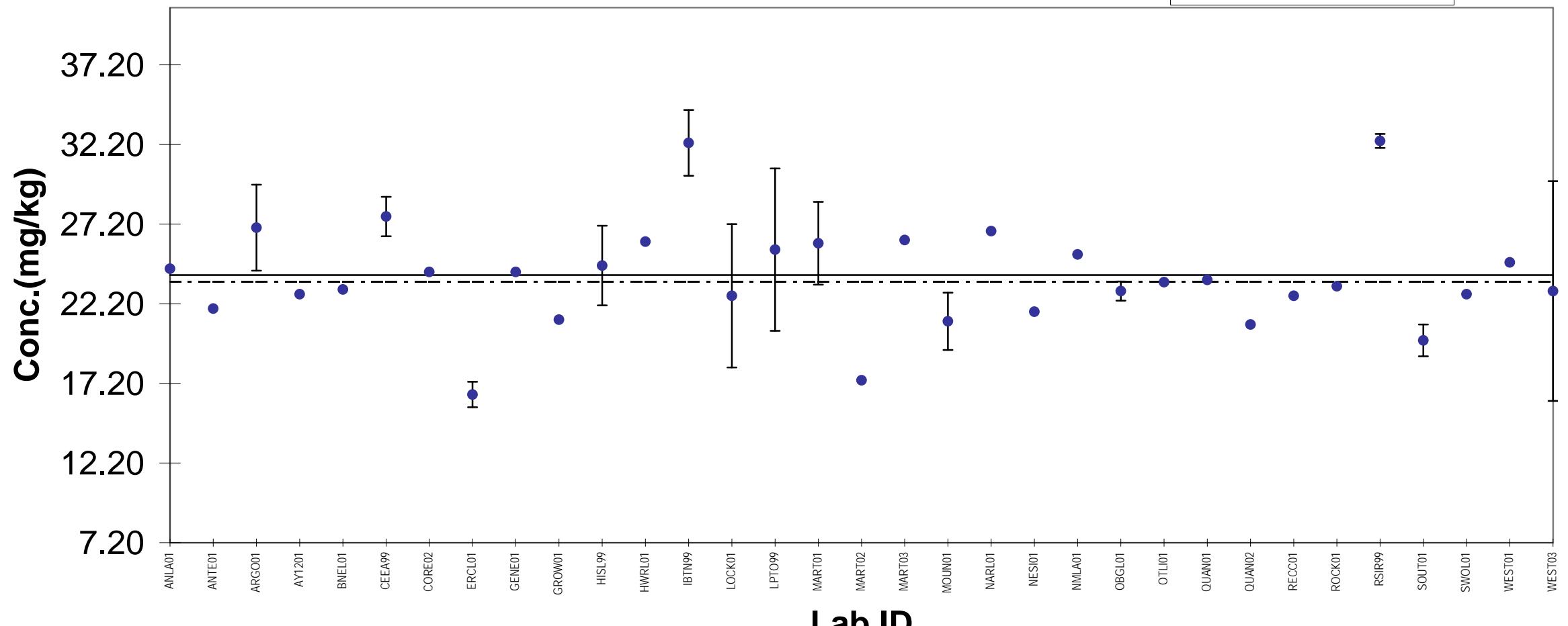
Lead MAPEP-02-S9

• Lab Result
— Ref. Value 38.1
- - - Mean 36.31



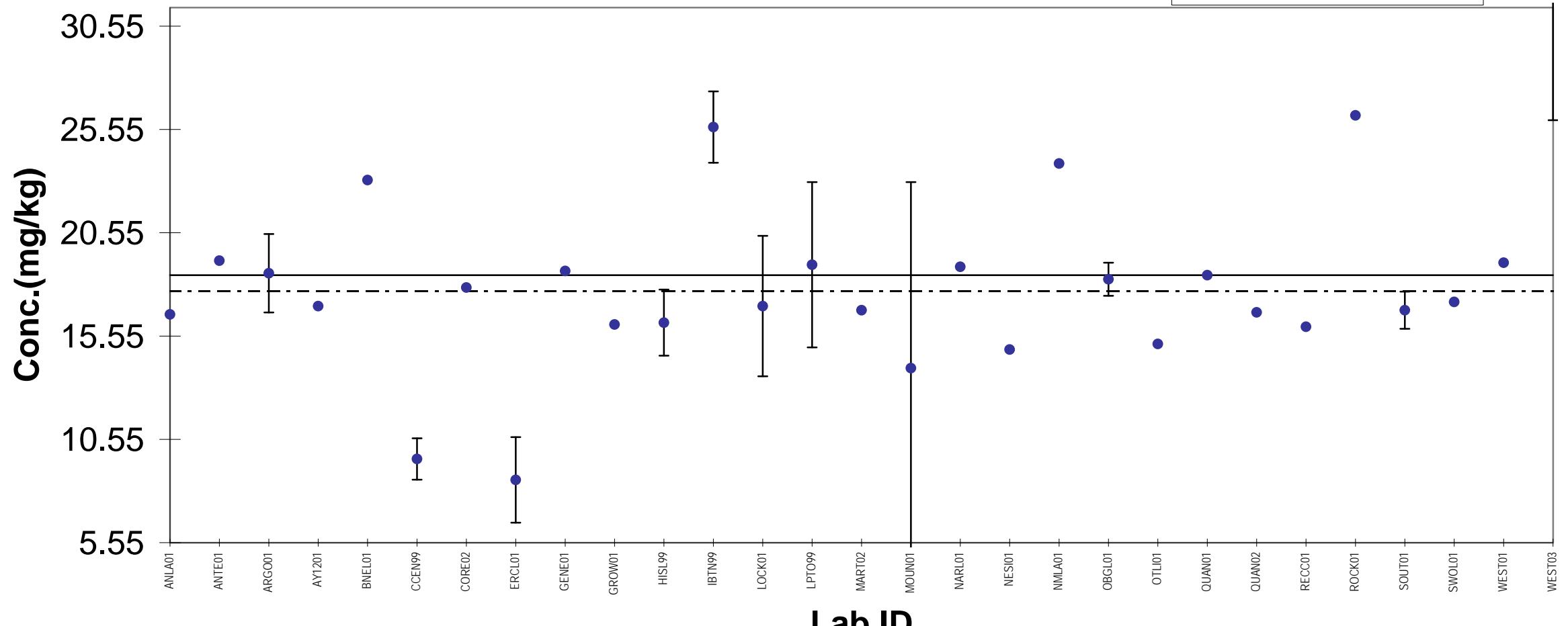
Nickel MAPEP-02-S9

• Lab Result
— Ref. Value 24
- - - Mean 23.58



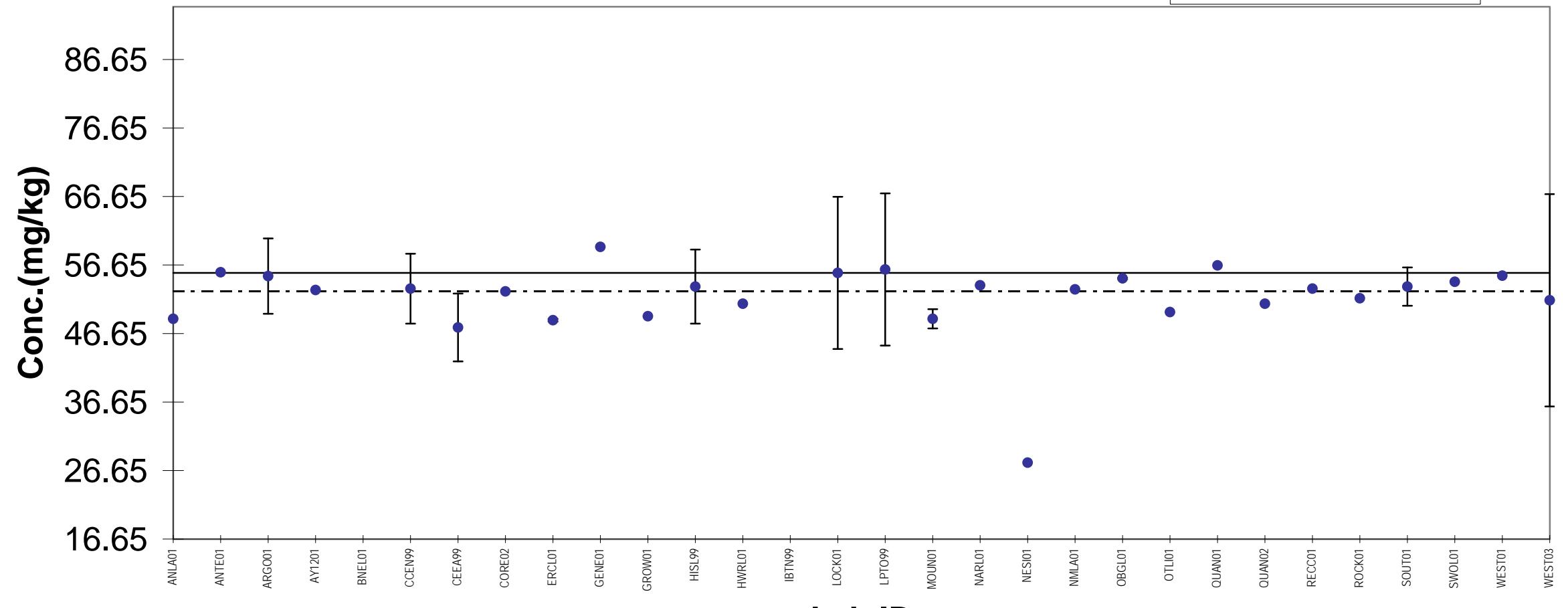
Selenium MAPEP-02-S9

• Lab Result
— Ref. Value 18.5
- - - Mean 17.73



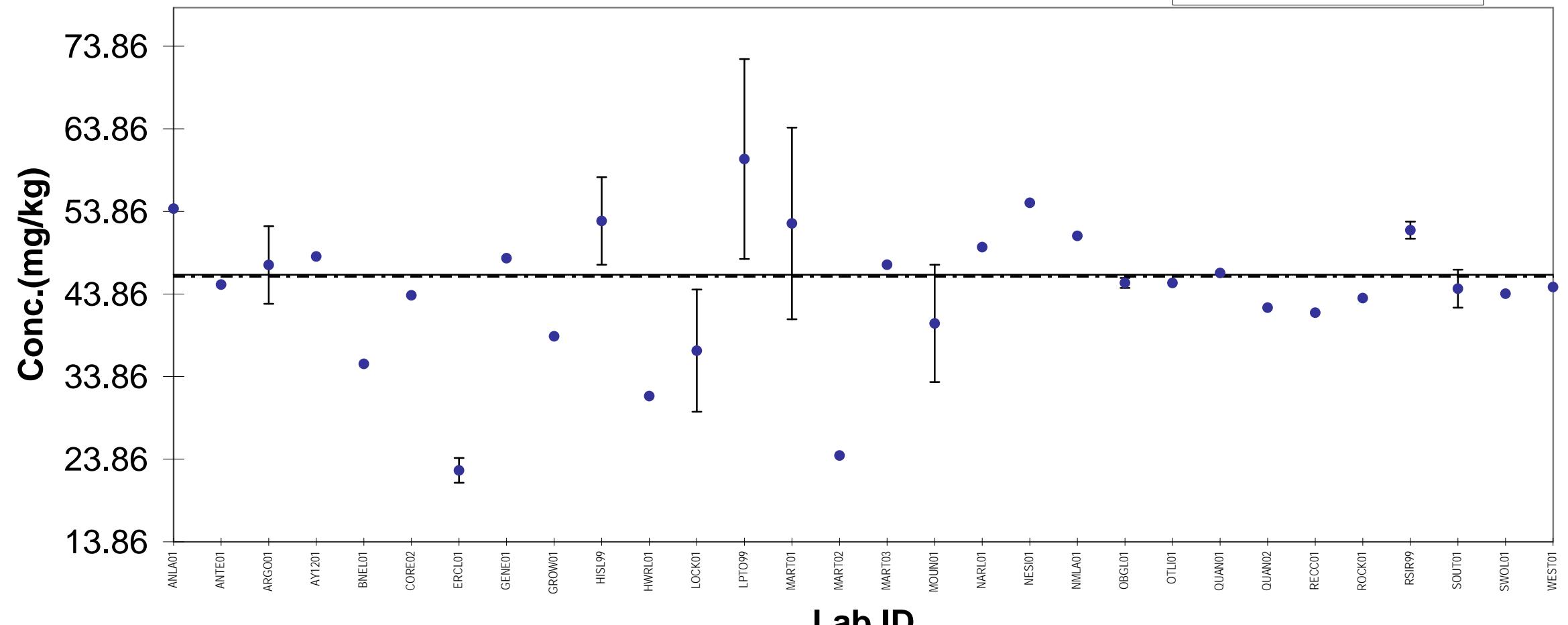
Silver MAPEP-02-S9

• Lab Result
— Ref. Value 55.5
- - - Mean 52.81



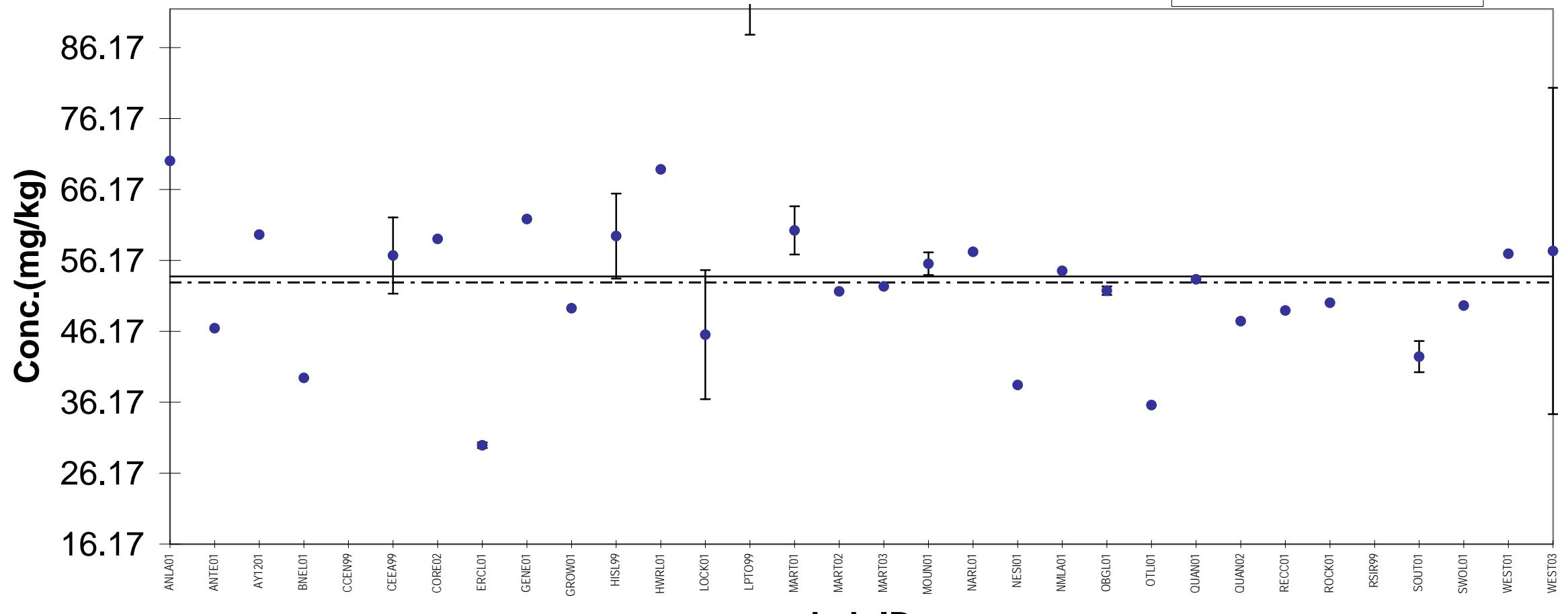
Thallium MAPEP-02-S9

• Lab Result
— Ref. Value 46.2
- - - Mean 45.95



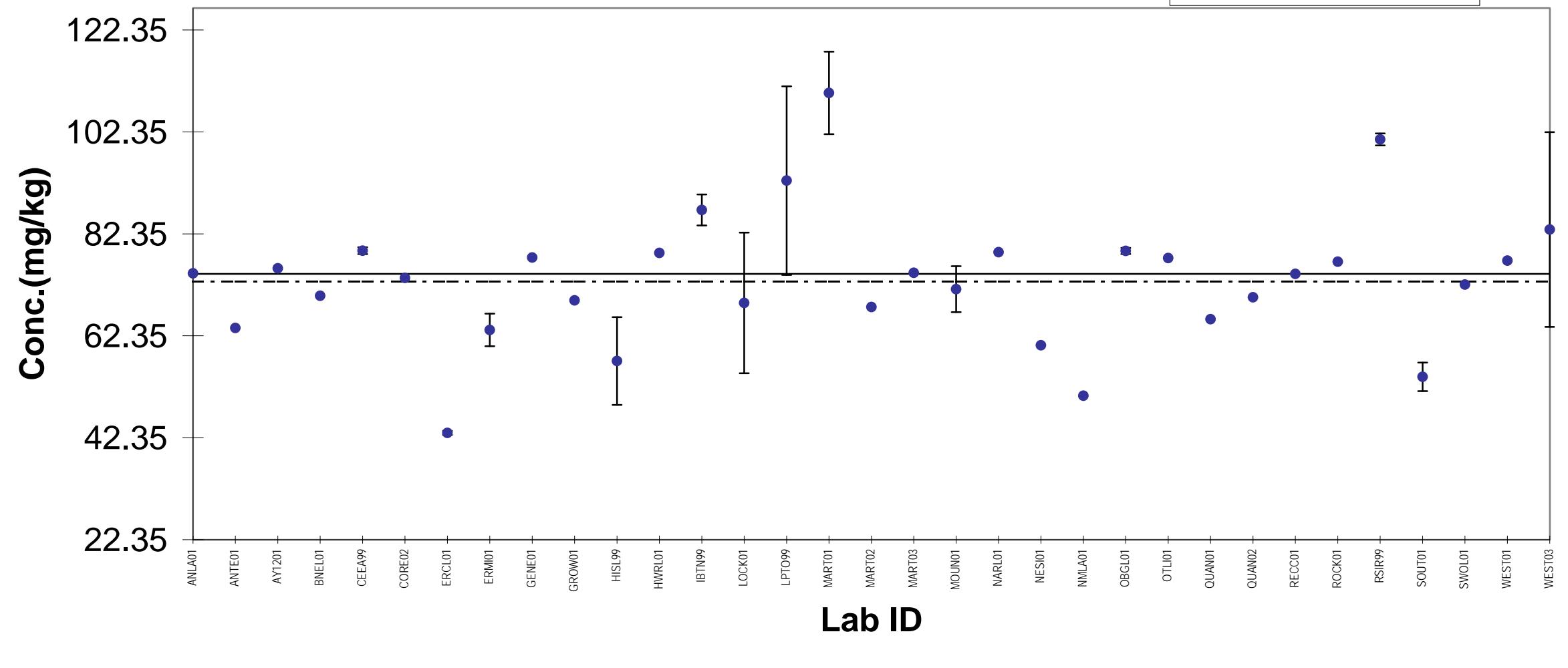
Vanadium MAPEP-02-S9

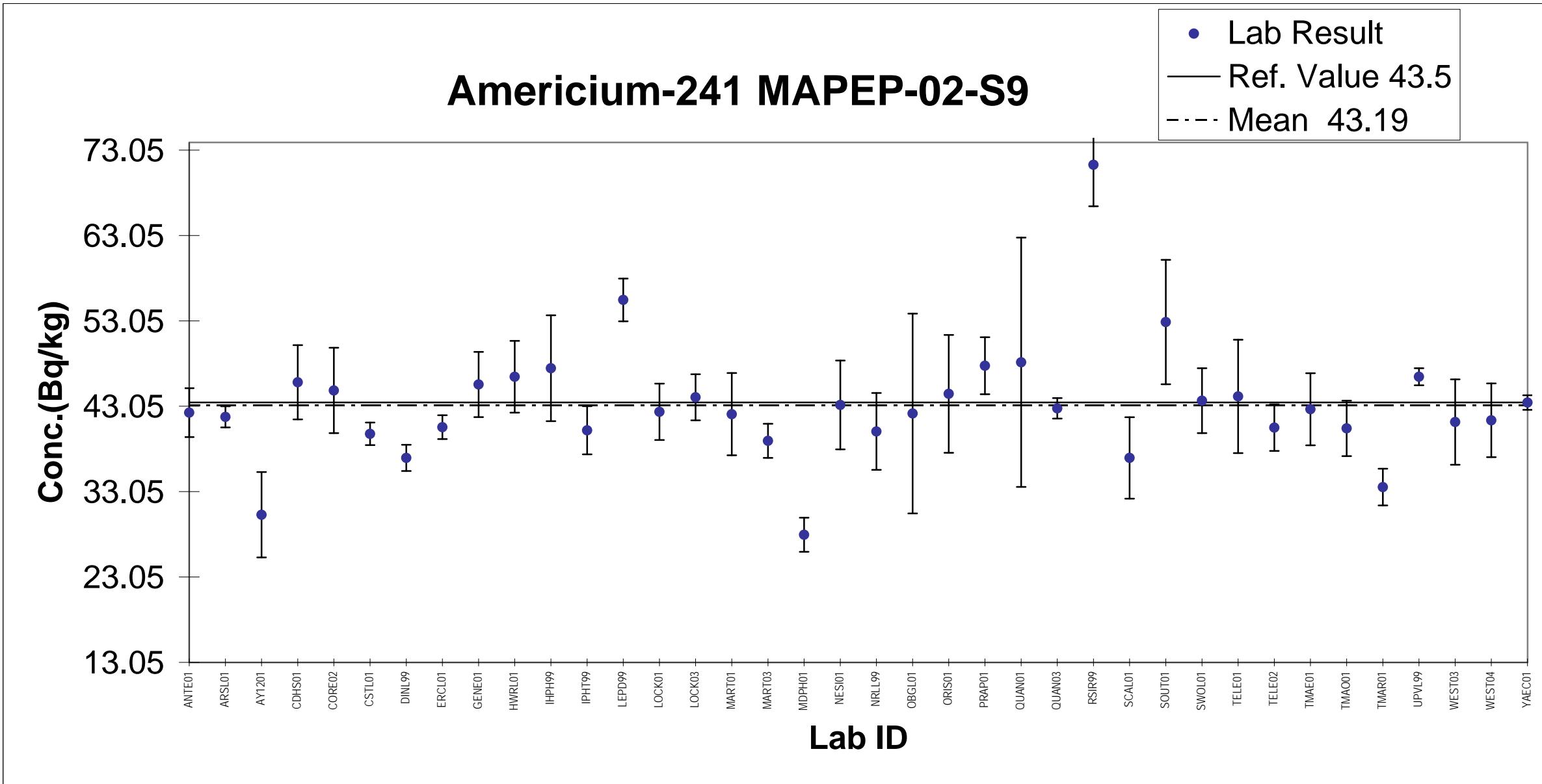
• Lab Result
— Ref. Value 53.9
- - - Mean 53



Zinc MAPEP-02-S9

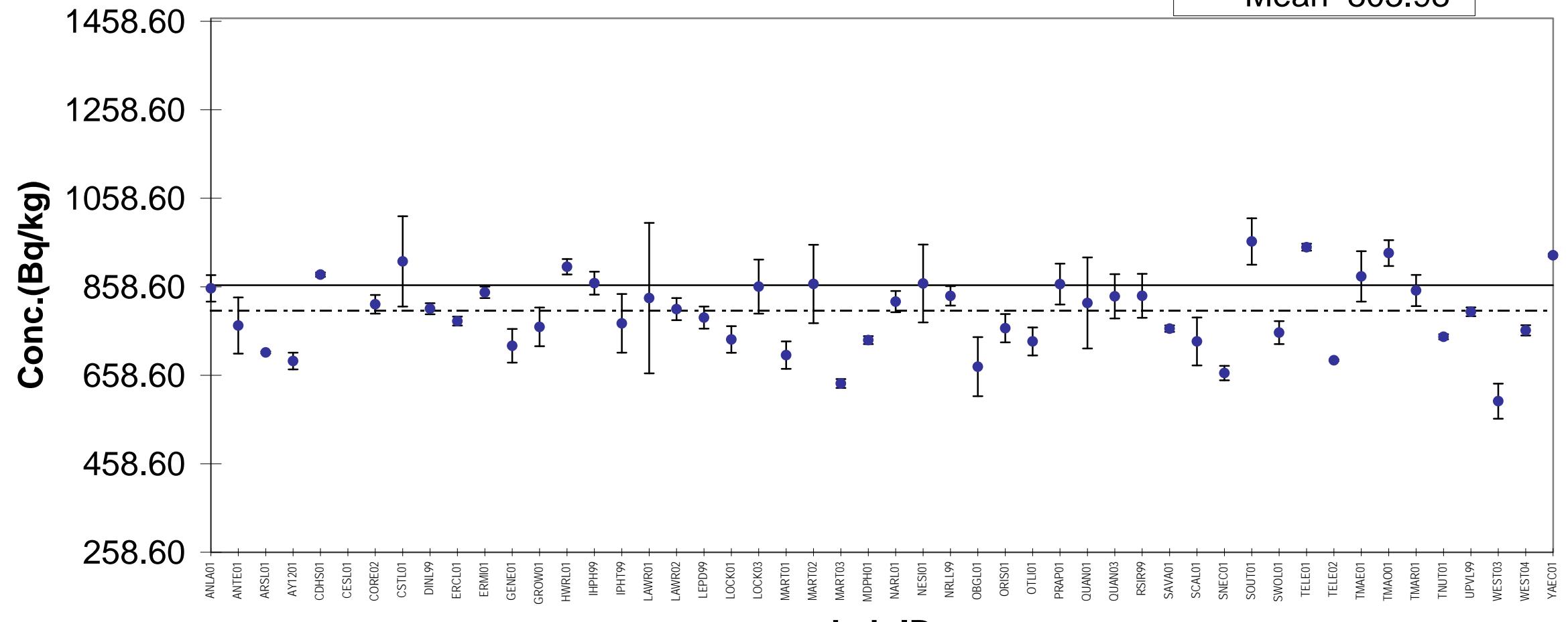
• Lab Result
— Ref. Value 74.5
- - - Mean 72.97





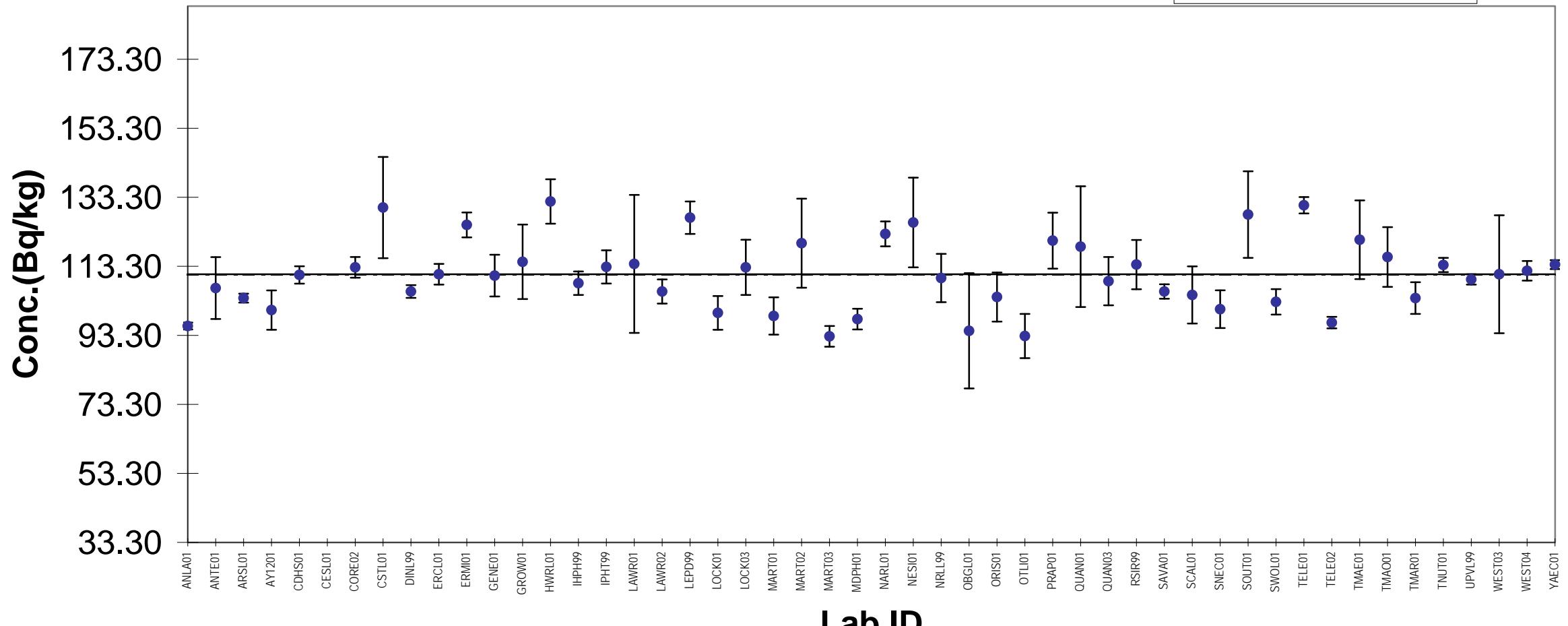
Cesium-134 MAPEP-02-S9

• Lab Result
— Ref. Value 862
- - - Mean 803.98



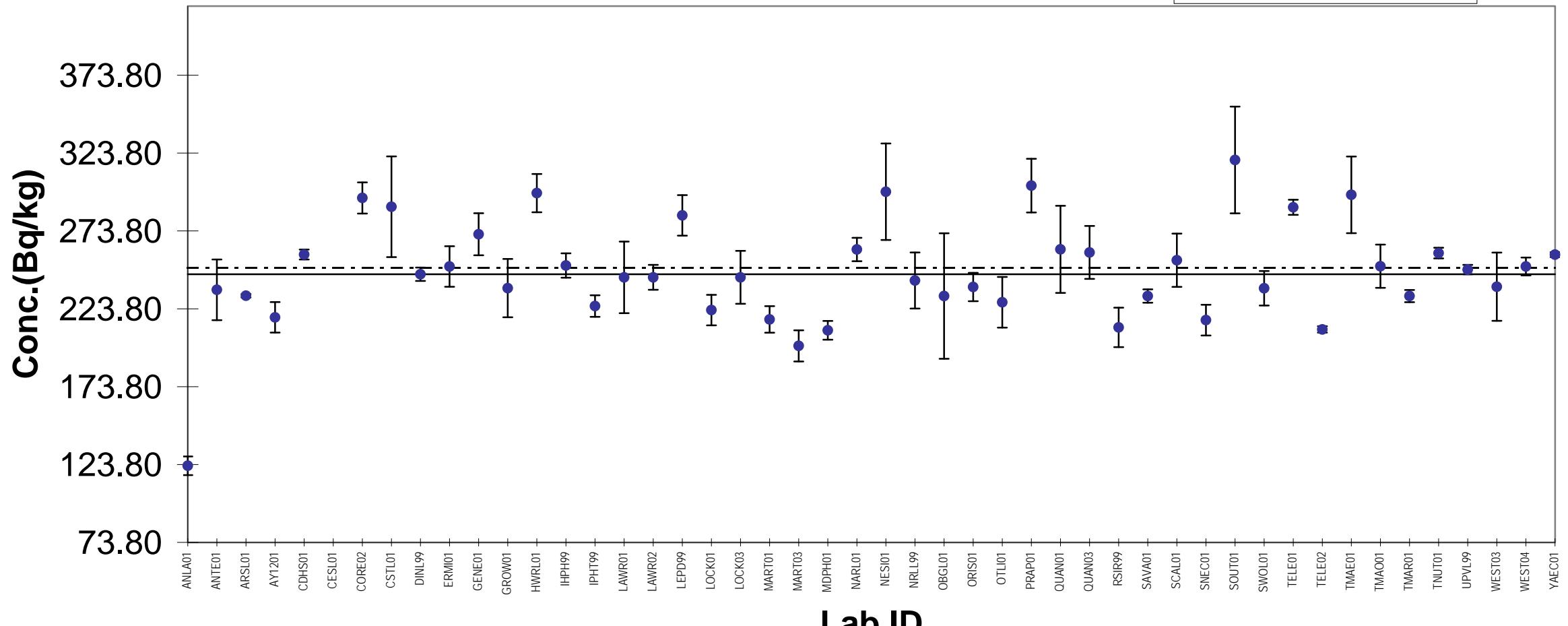
Cesium-137 MAPEP-02-S9

• Lab Result
— Ref. Value 111
- - - Mean 110.99



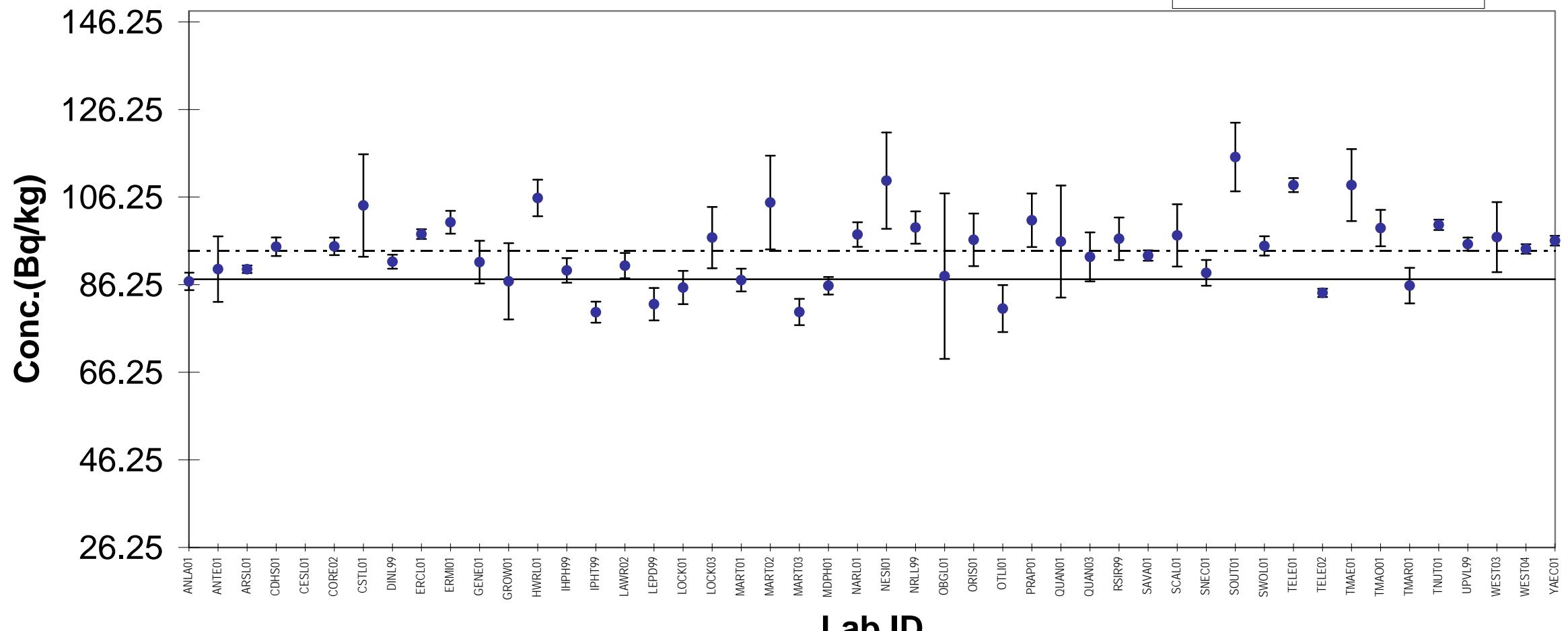
Cobalt-57 MAPEP-02-S9

• Lab Result
— Ref. Value 246
- - - Mean 250.21



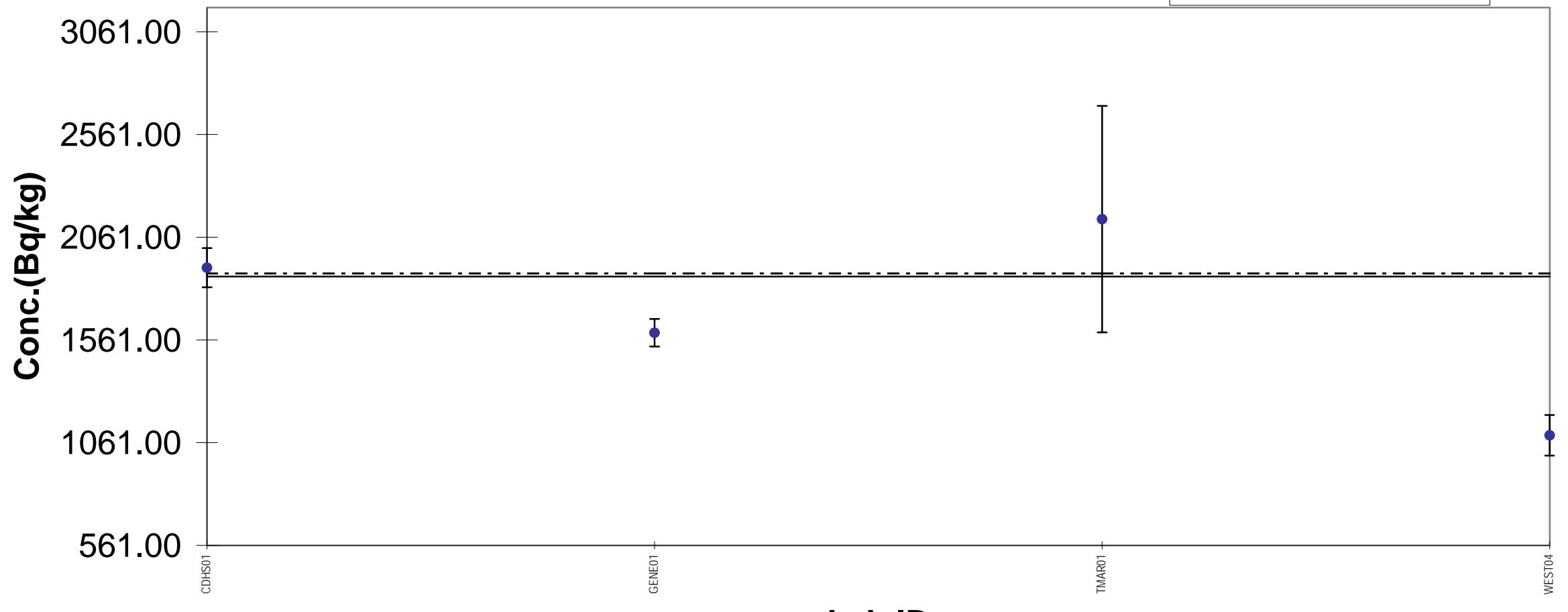
Cobalt-60 MAPEP-02-S9

• Lab Result
— Ref. Value 87.5
- - - Mean 93.95



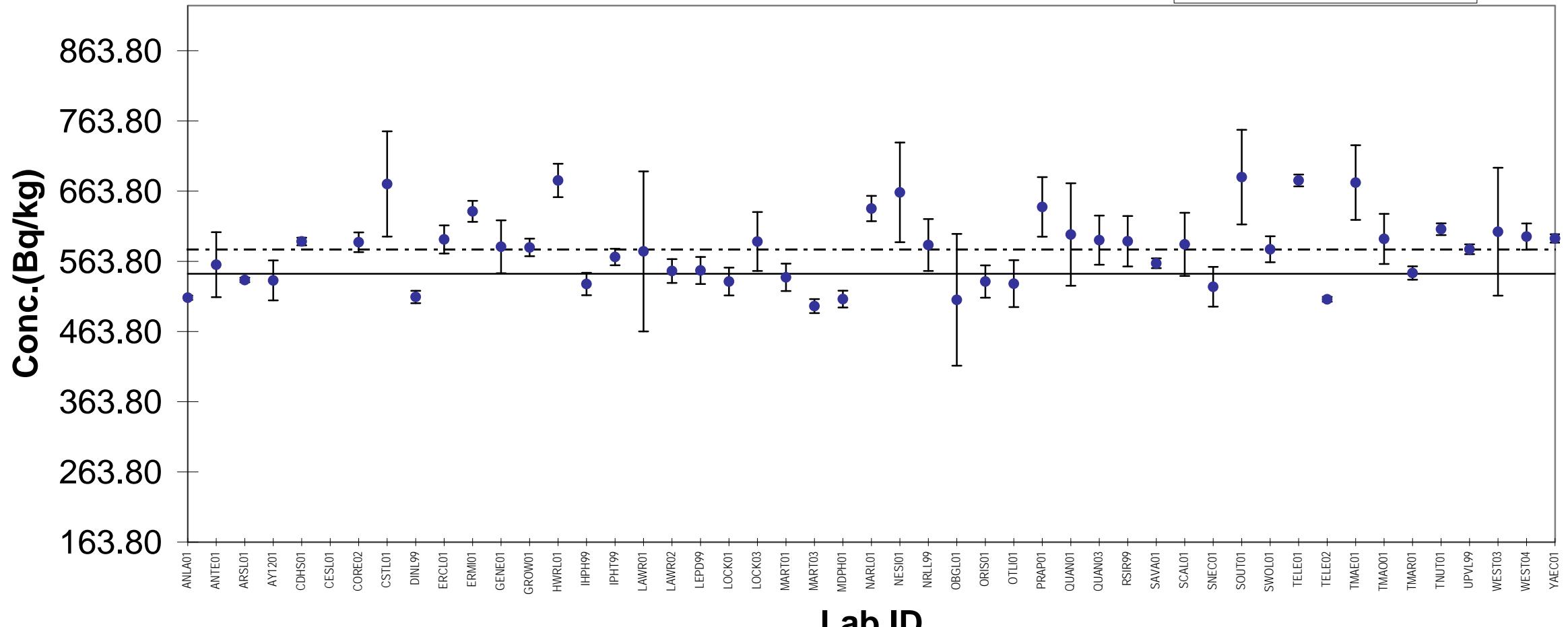
Iron-55 MAPEP-02-S9

• Lab Result
— Ref. Value 1870
--- Mean 1885.91



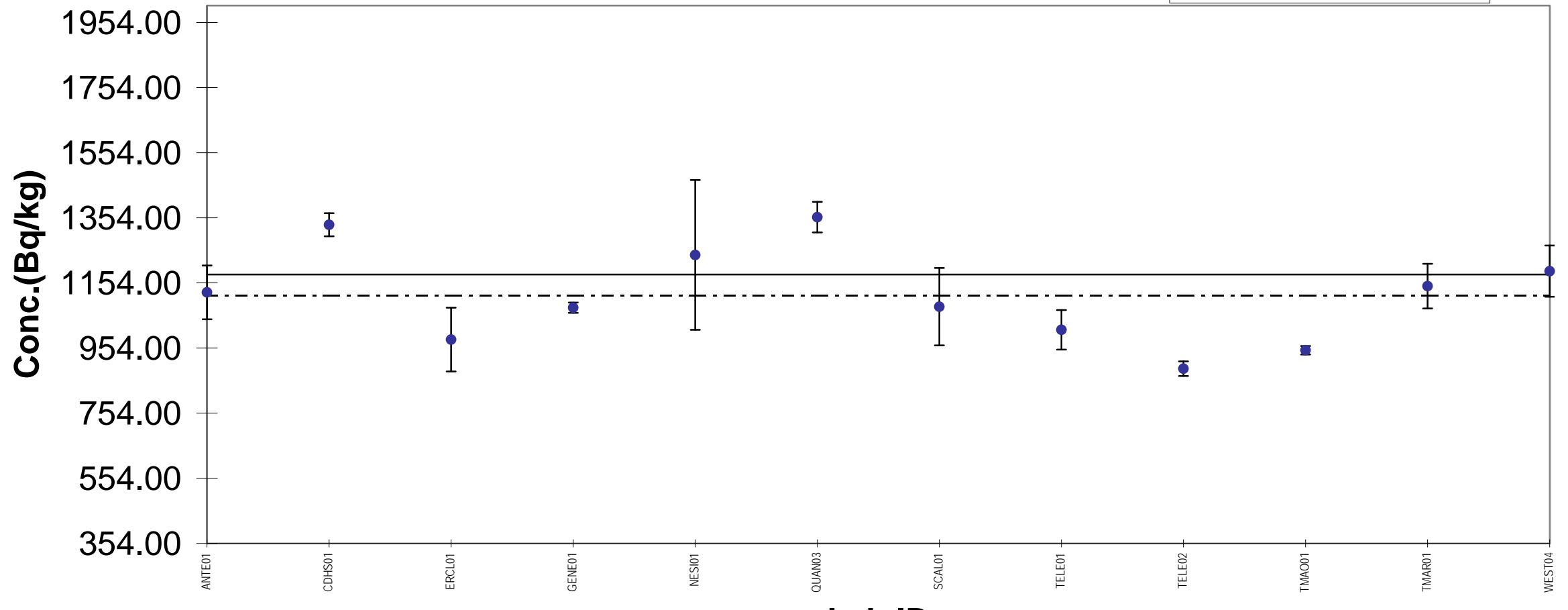
Manganese-54 MAPEP-02-S9

• Lab Result
— Ref. Value 546
- - - Mean 580.94



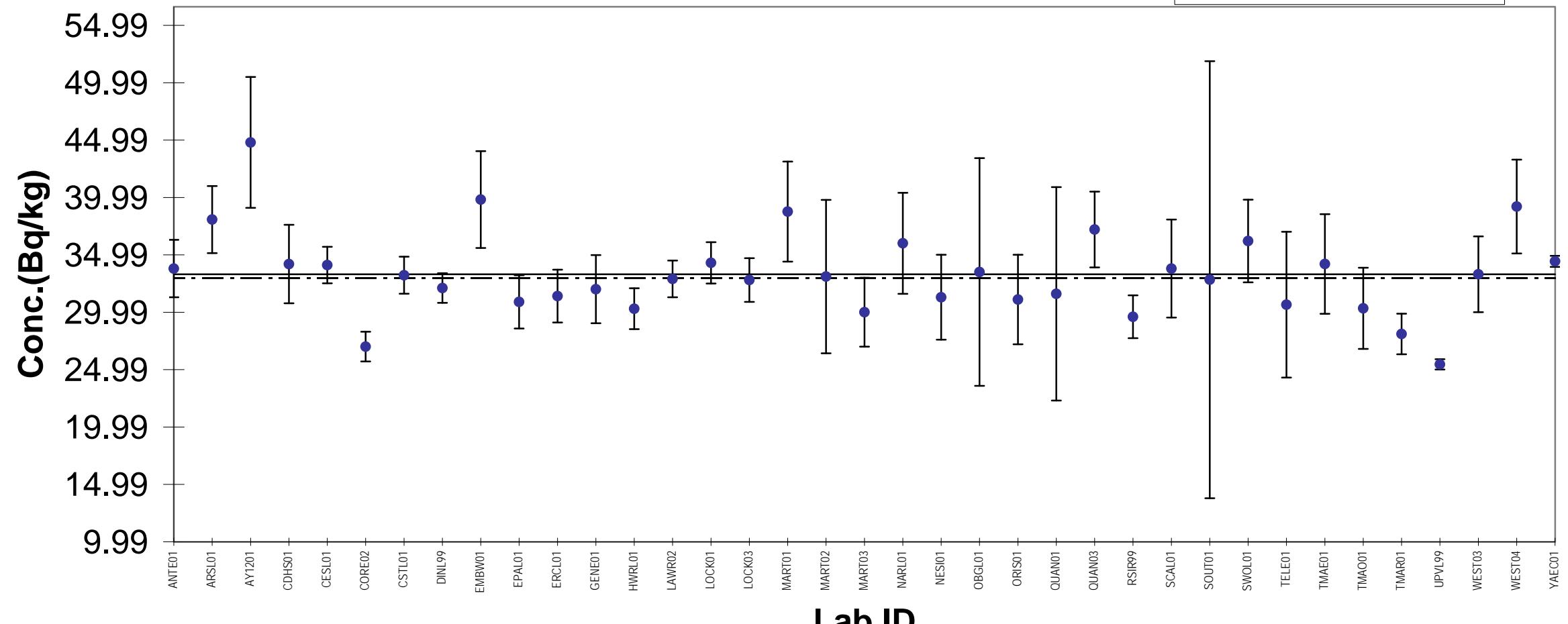
Nickel-63 MAPEP-02-S9

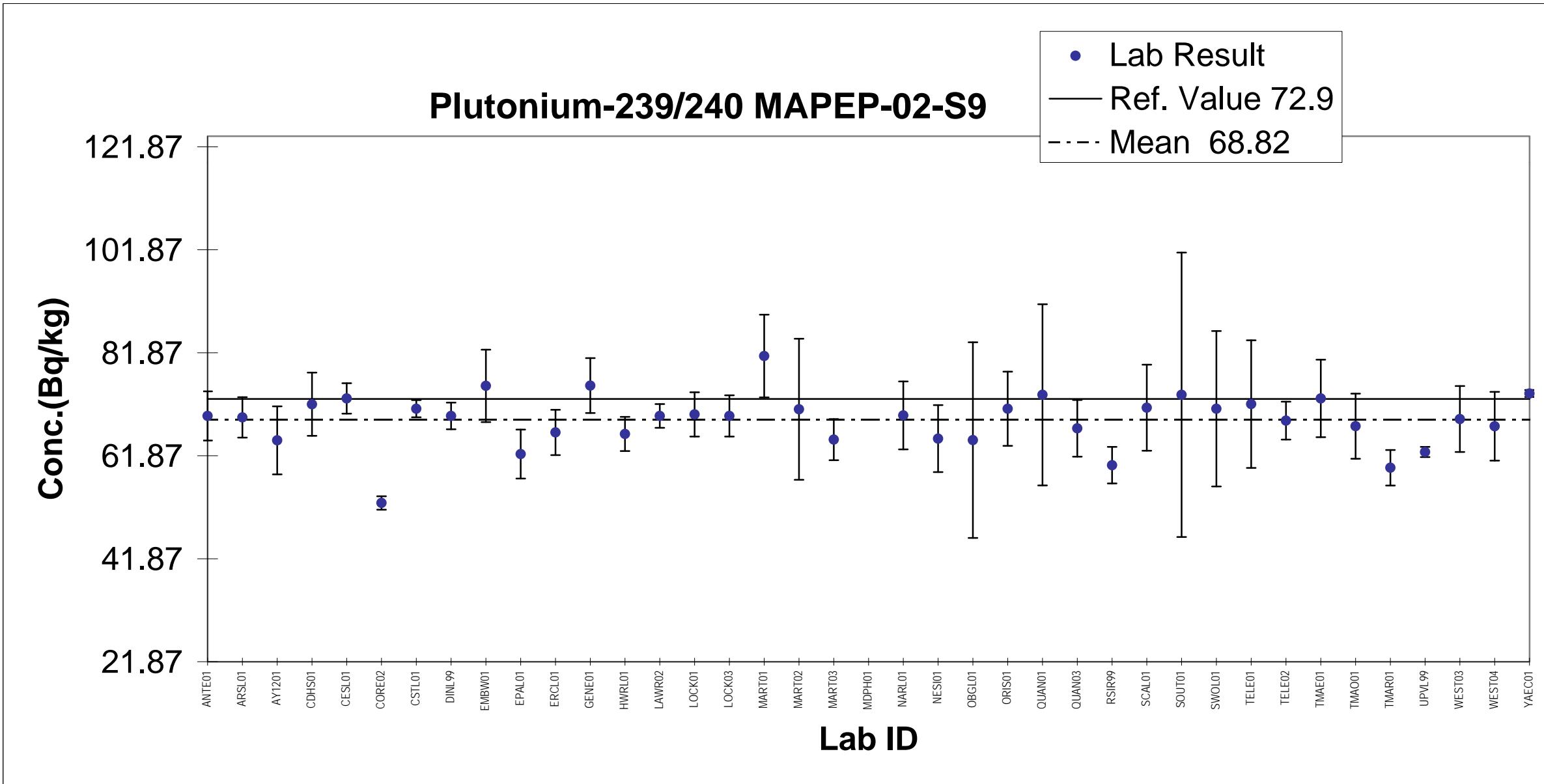
• Lab Result
— Ref. Value 1180
--- Mean 1114.56

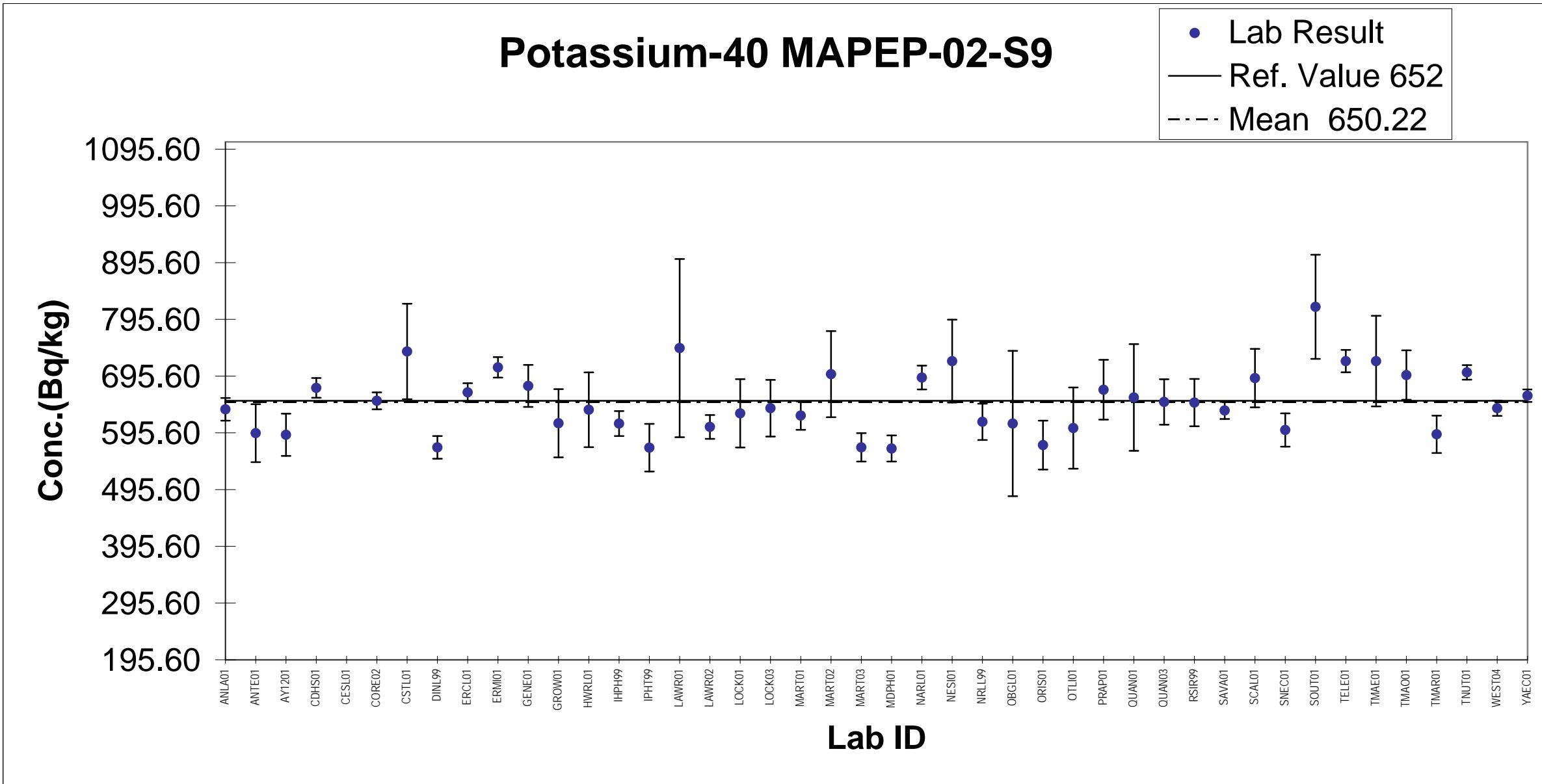


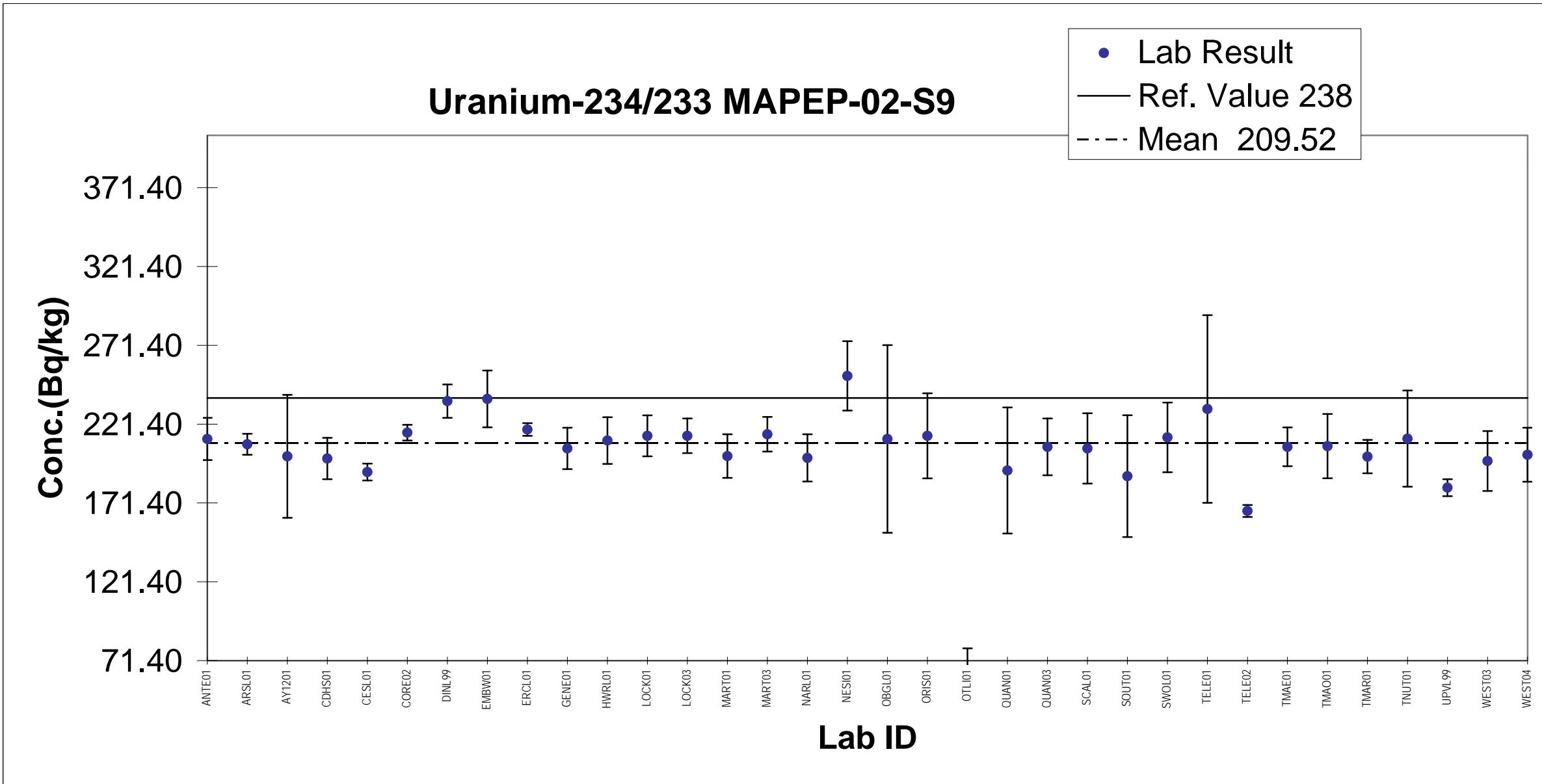
Plutonium-238 MAPEP-02-S9

• Lab Result
— Ref. Value 33.29
- - - Mean 32.98



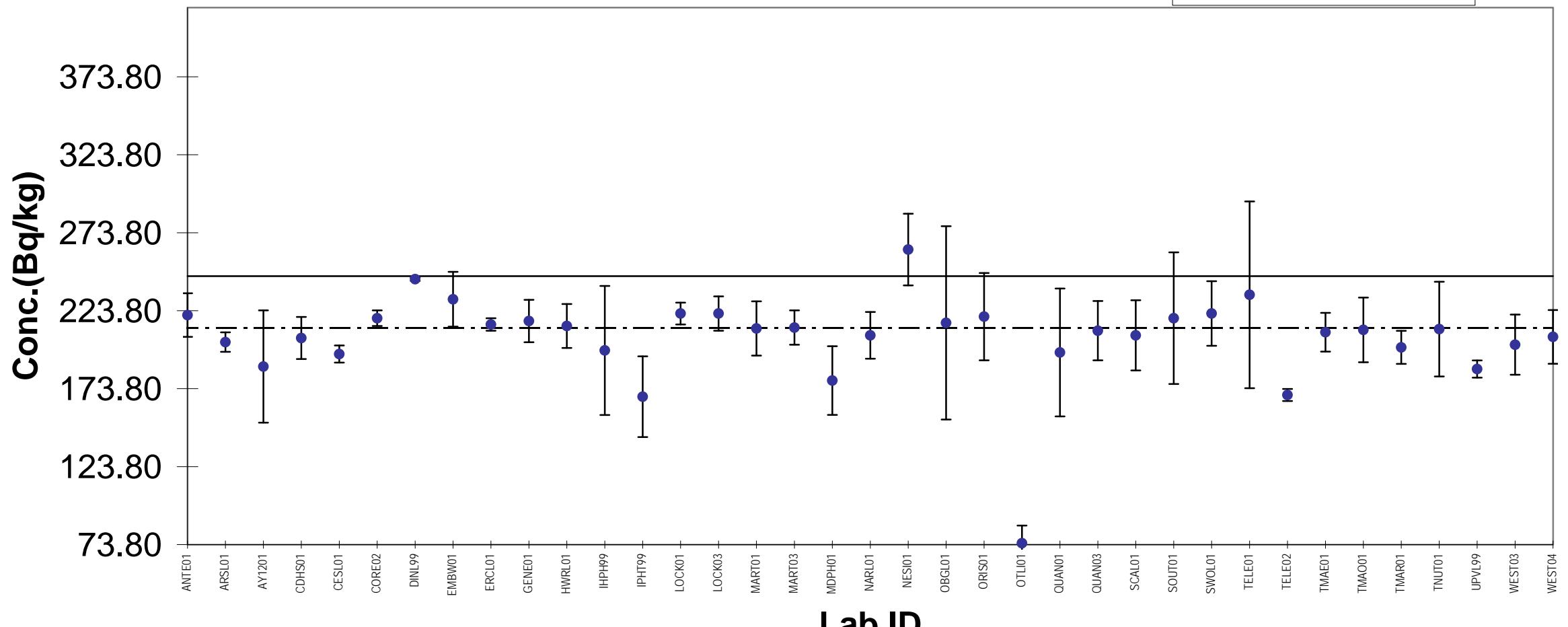






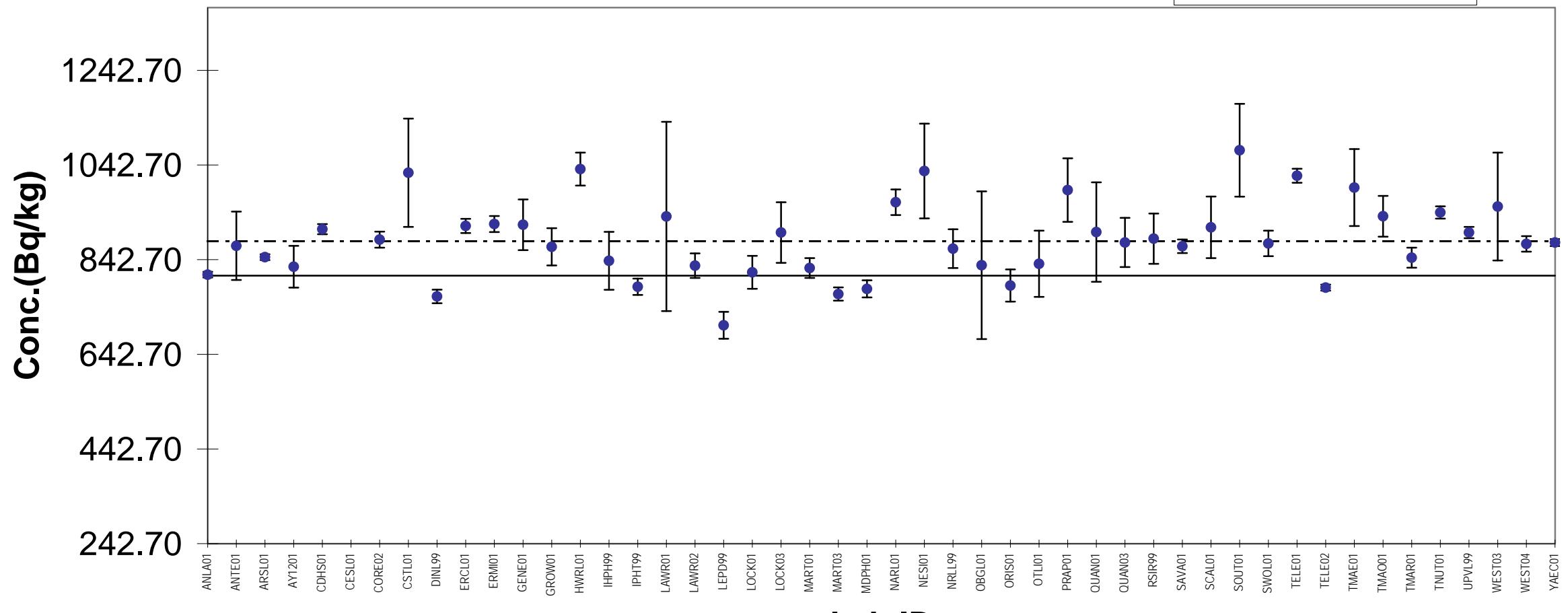
Uranium-238 MAPEP-02-S9

• Lab Result
— Ref. Value 246
- - - Mean 212.62



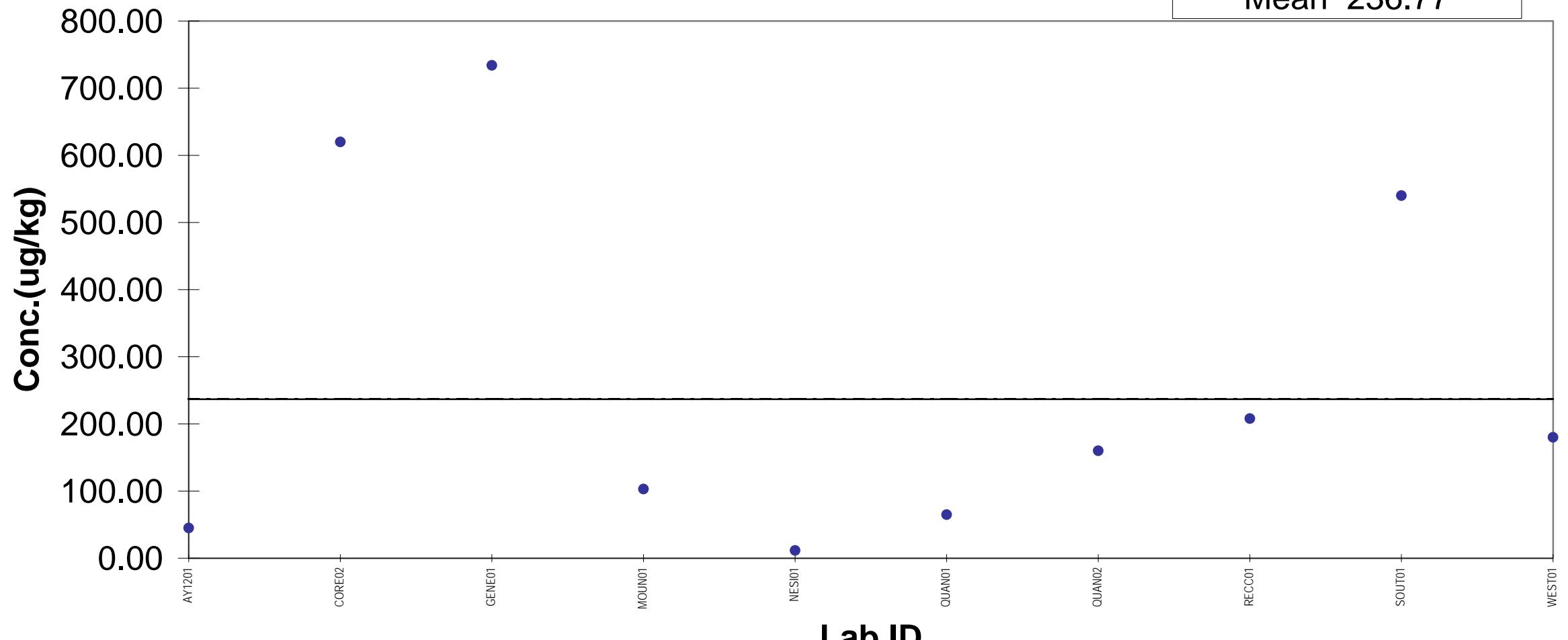
Zinc-65 MAPEP-02-S9

• Lab Result
— Ref. Value 809
- - - Mean 881.33



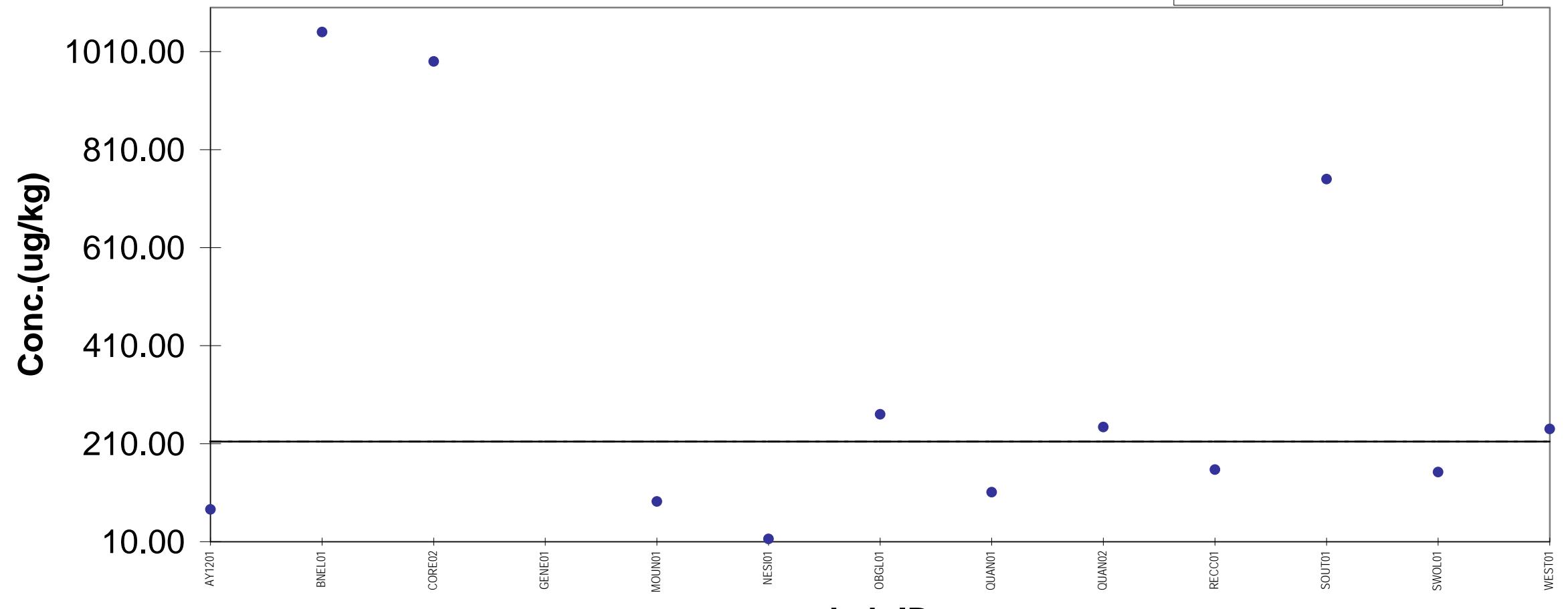
Cumene MAPEP-02-S9

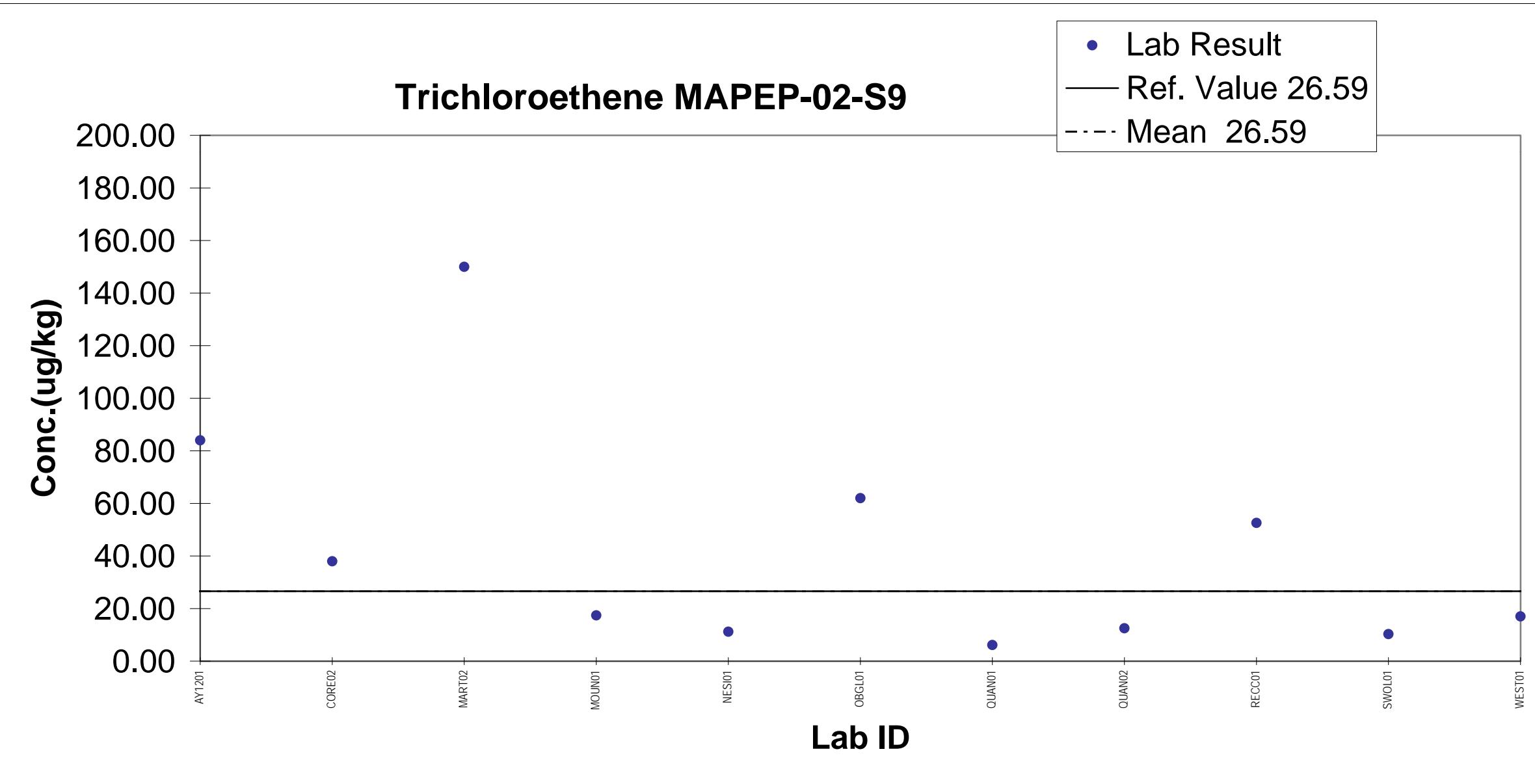
• Lab Result
— Ref. Value 236.77
- - - Mean 236.77

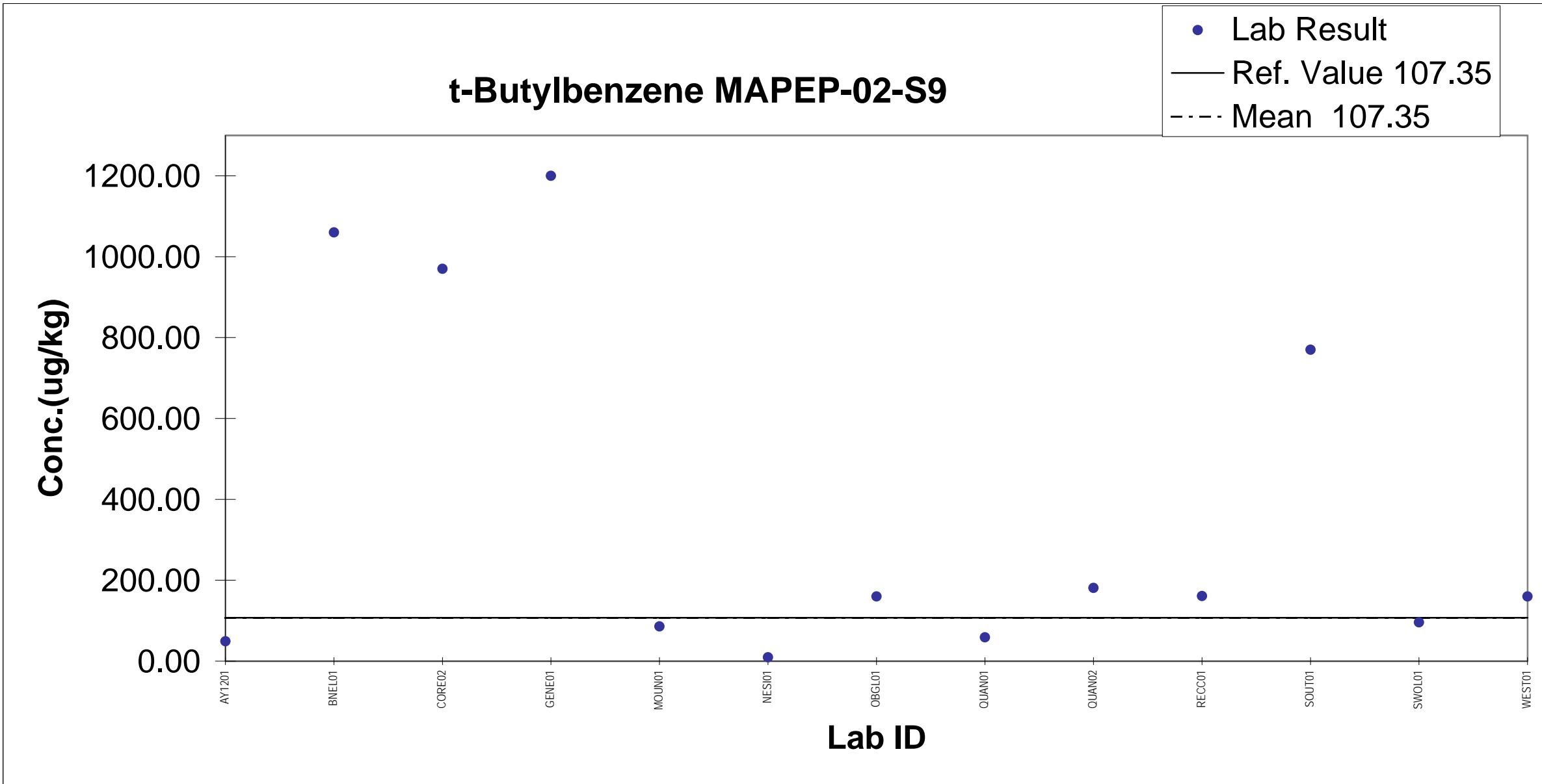


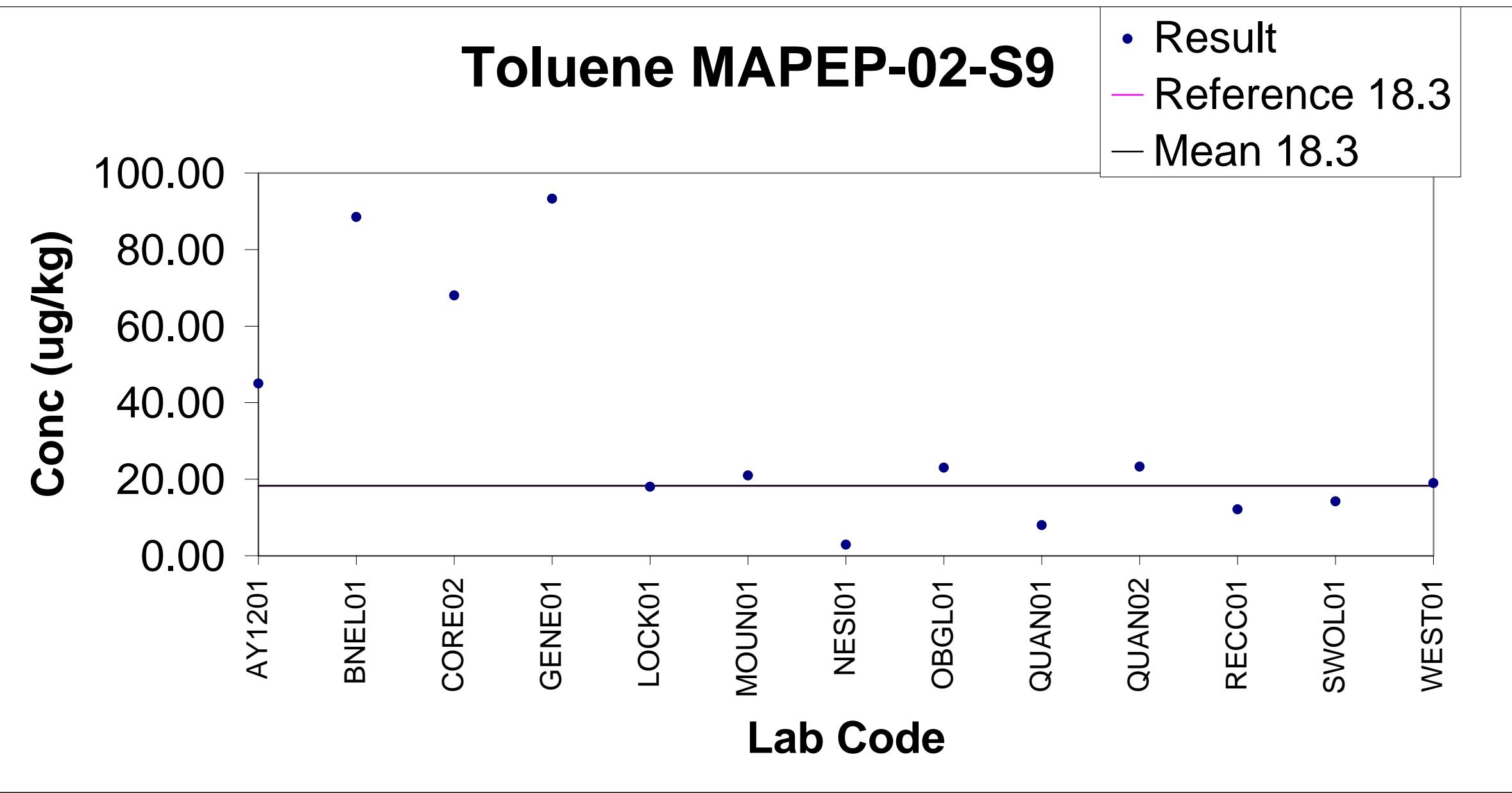
1,2,4-Trimethylbenzene MAPEP-02-S9

• Lab Result
— Ref. Value 214.2
- - - Mean 214.2

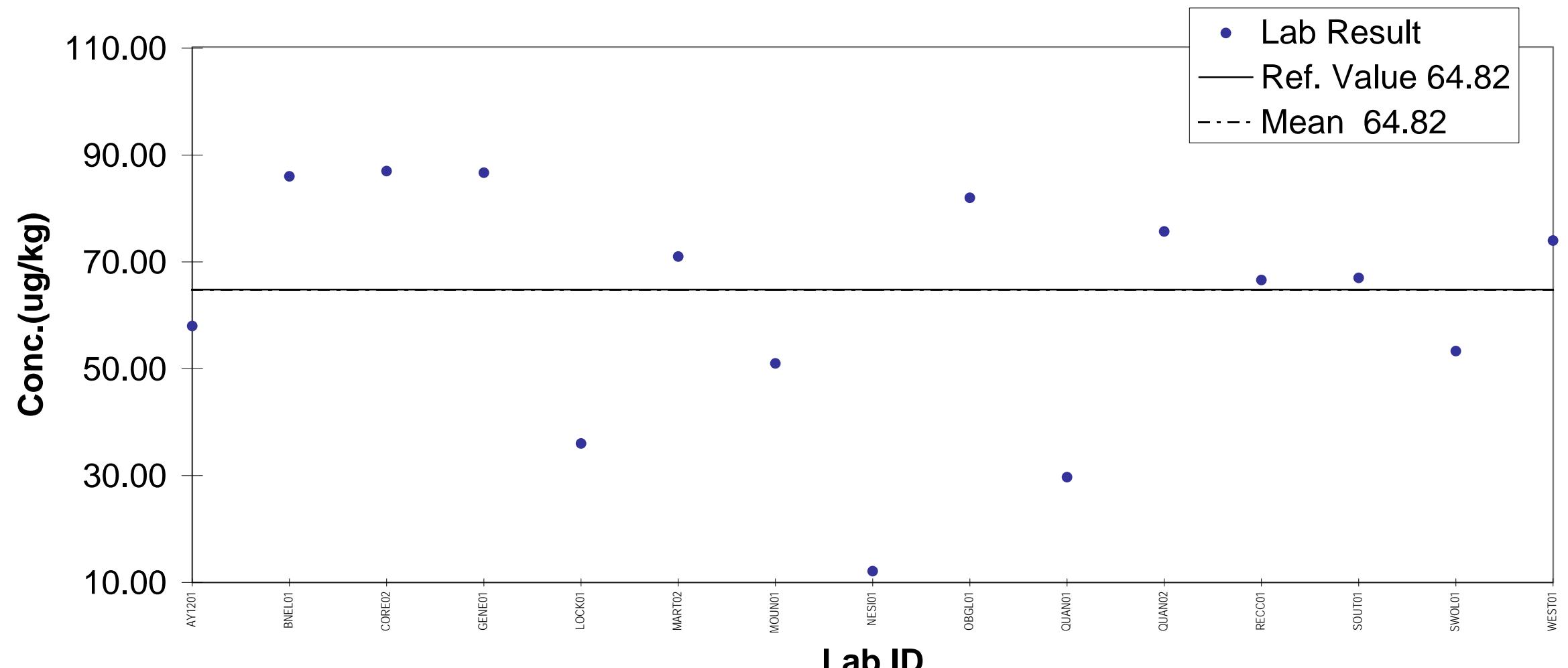


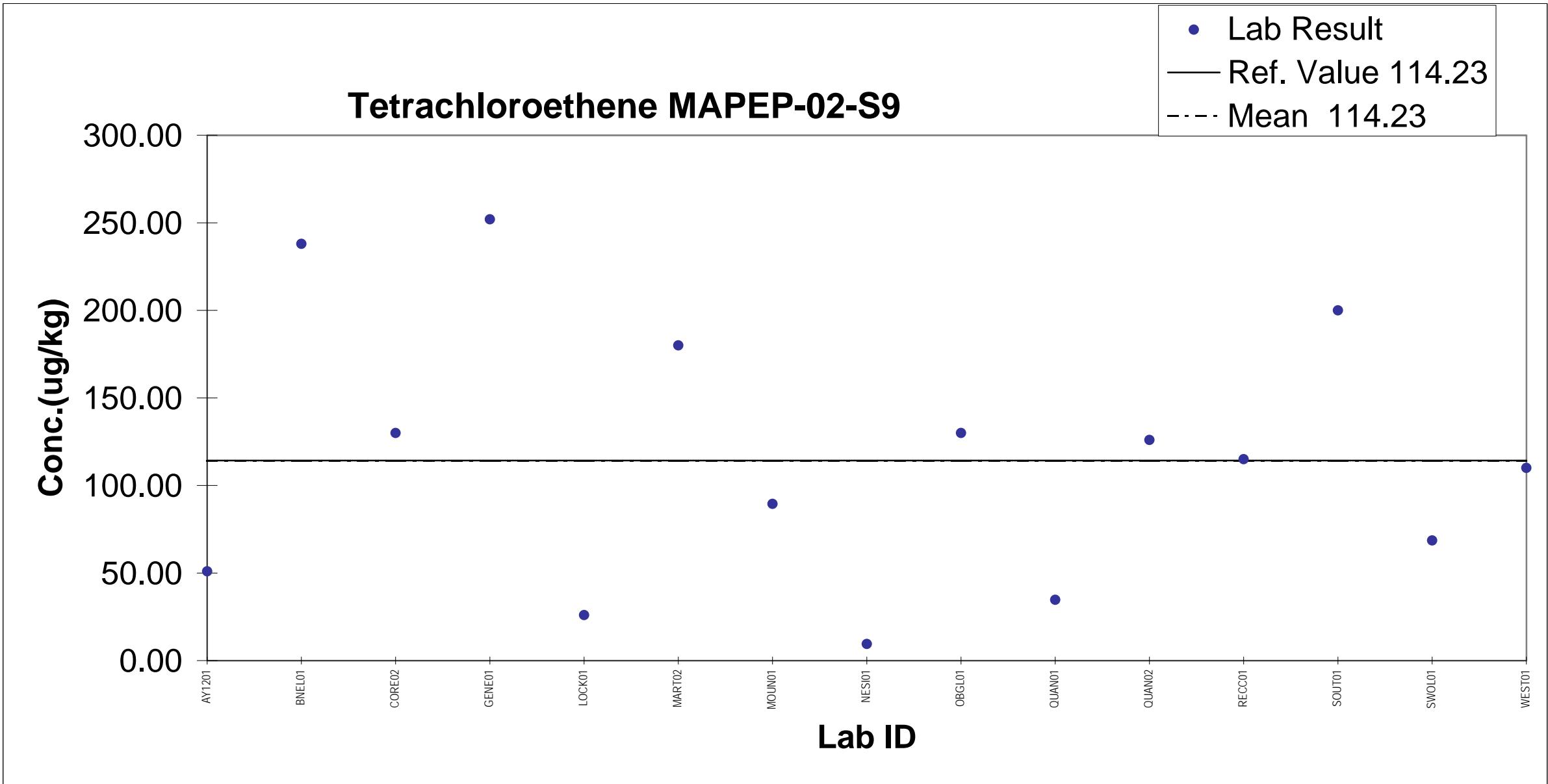


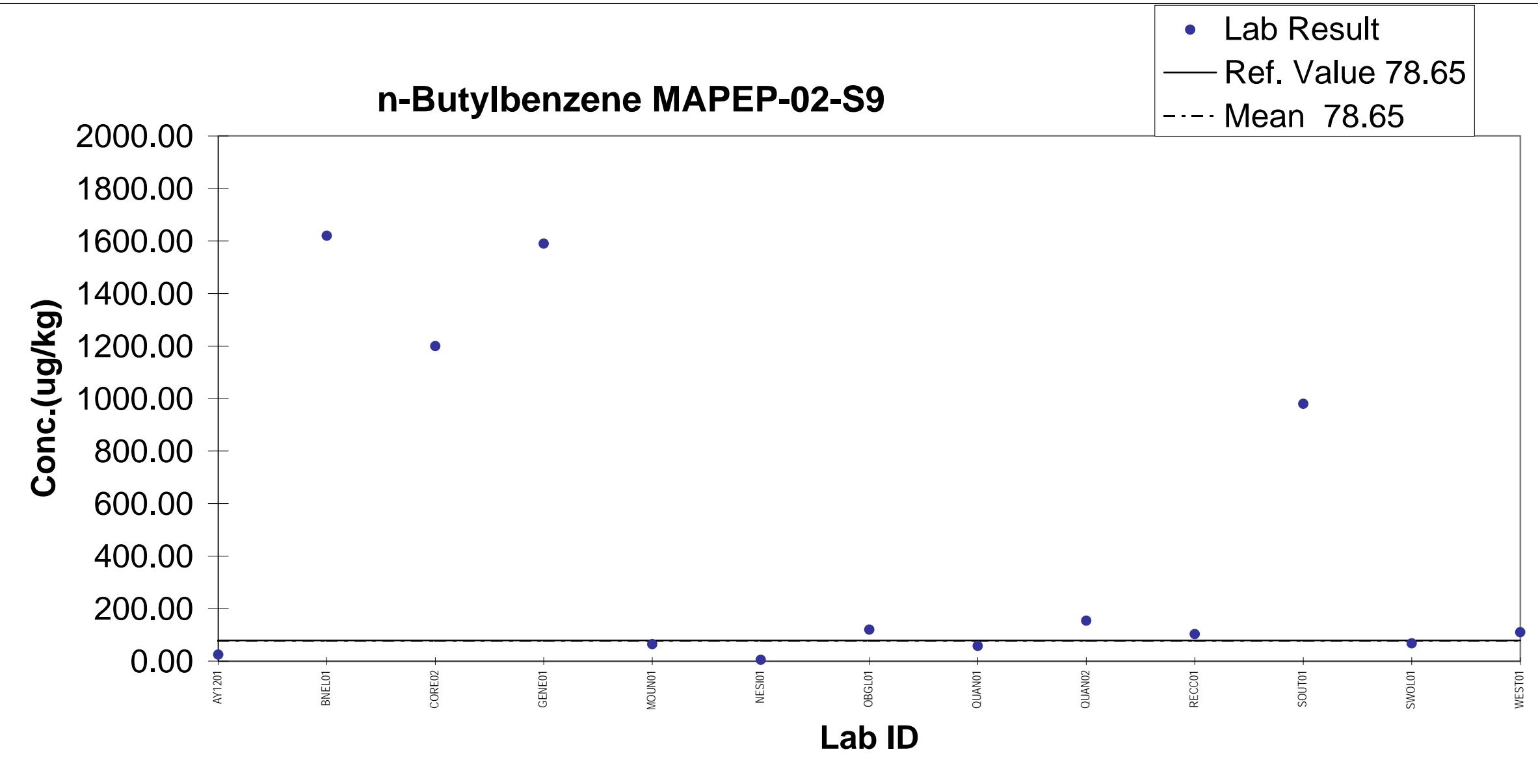




1,1,2-Trichloroethane MAPEP-02-S9

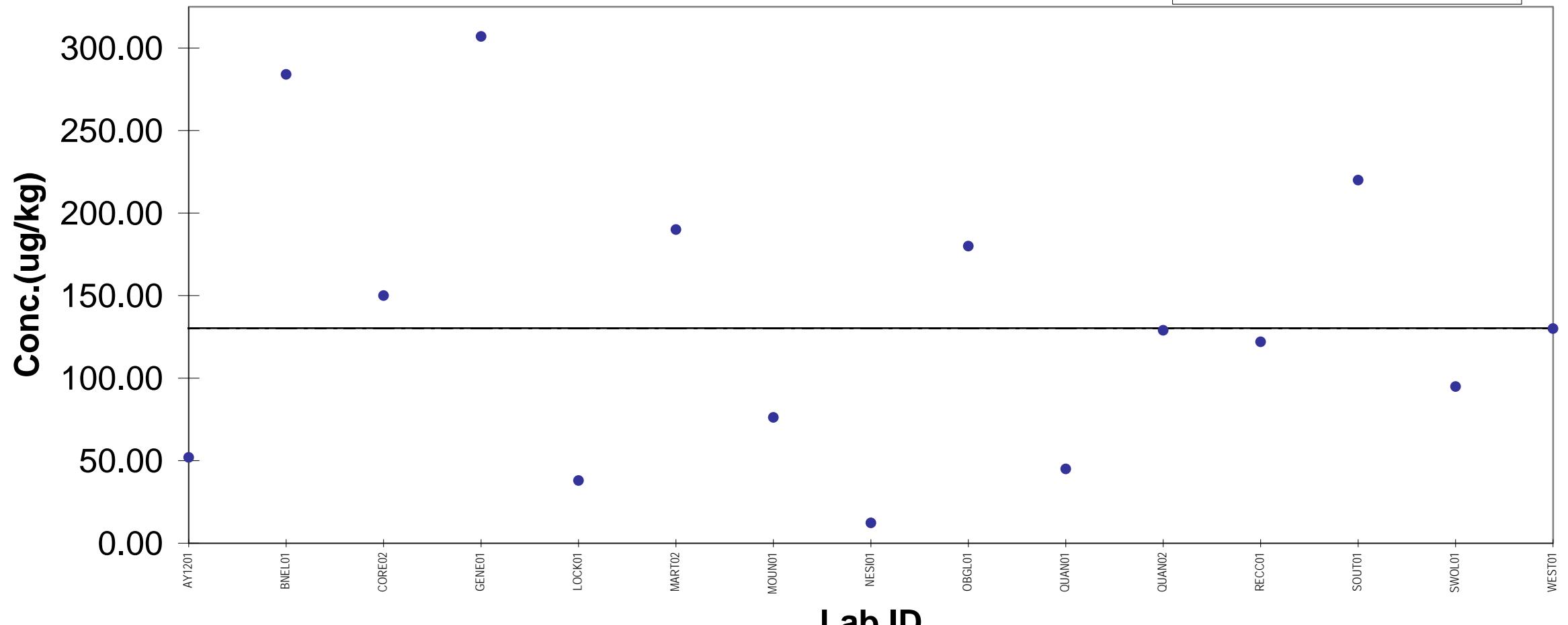






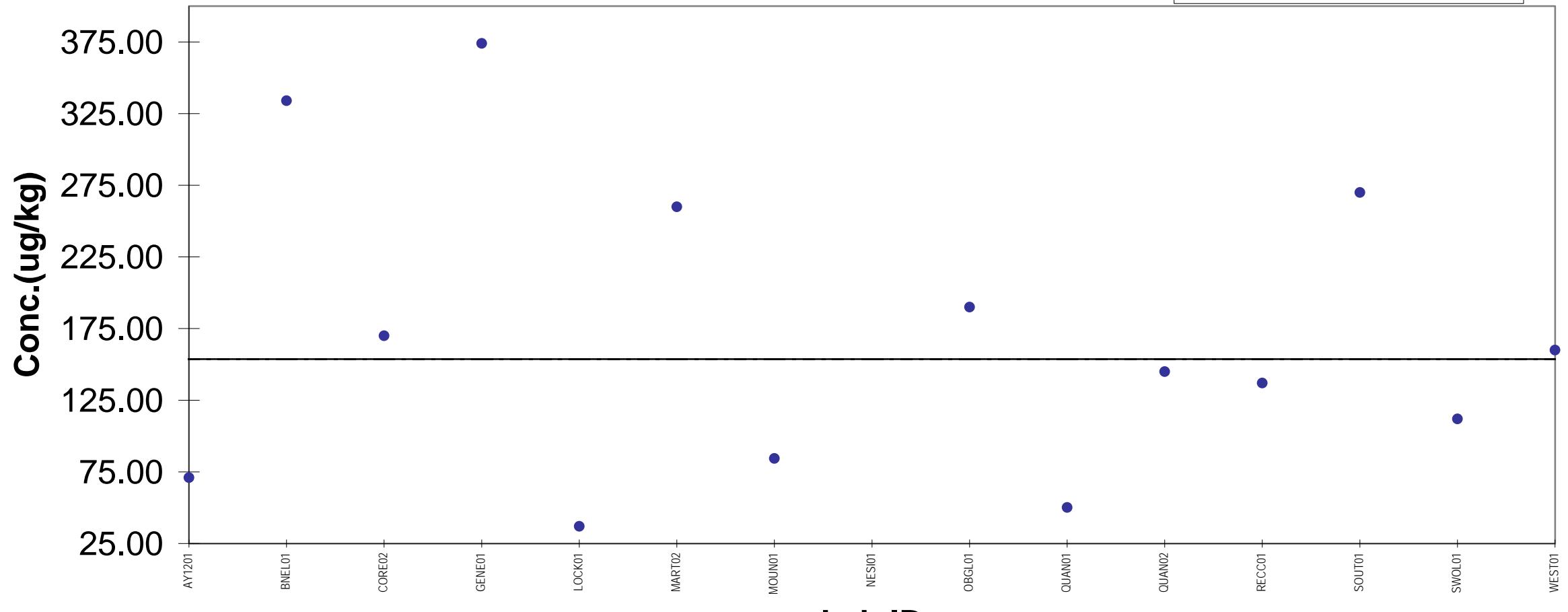
Ethylbenzene MAPEP-02-S9

• Lab Result
— Ref. Value 130.26
- - - Mean 130.26



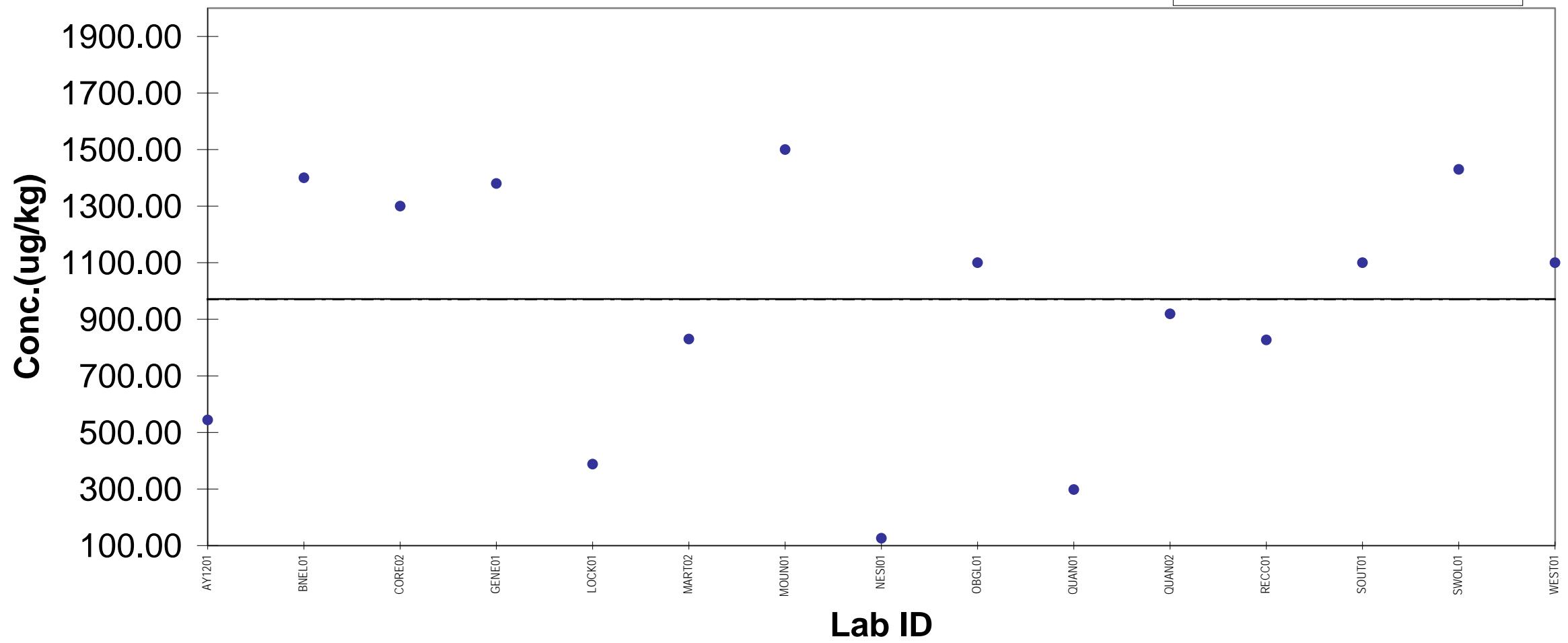
m & p-Xylene MAPEP-02-S9

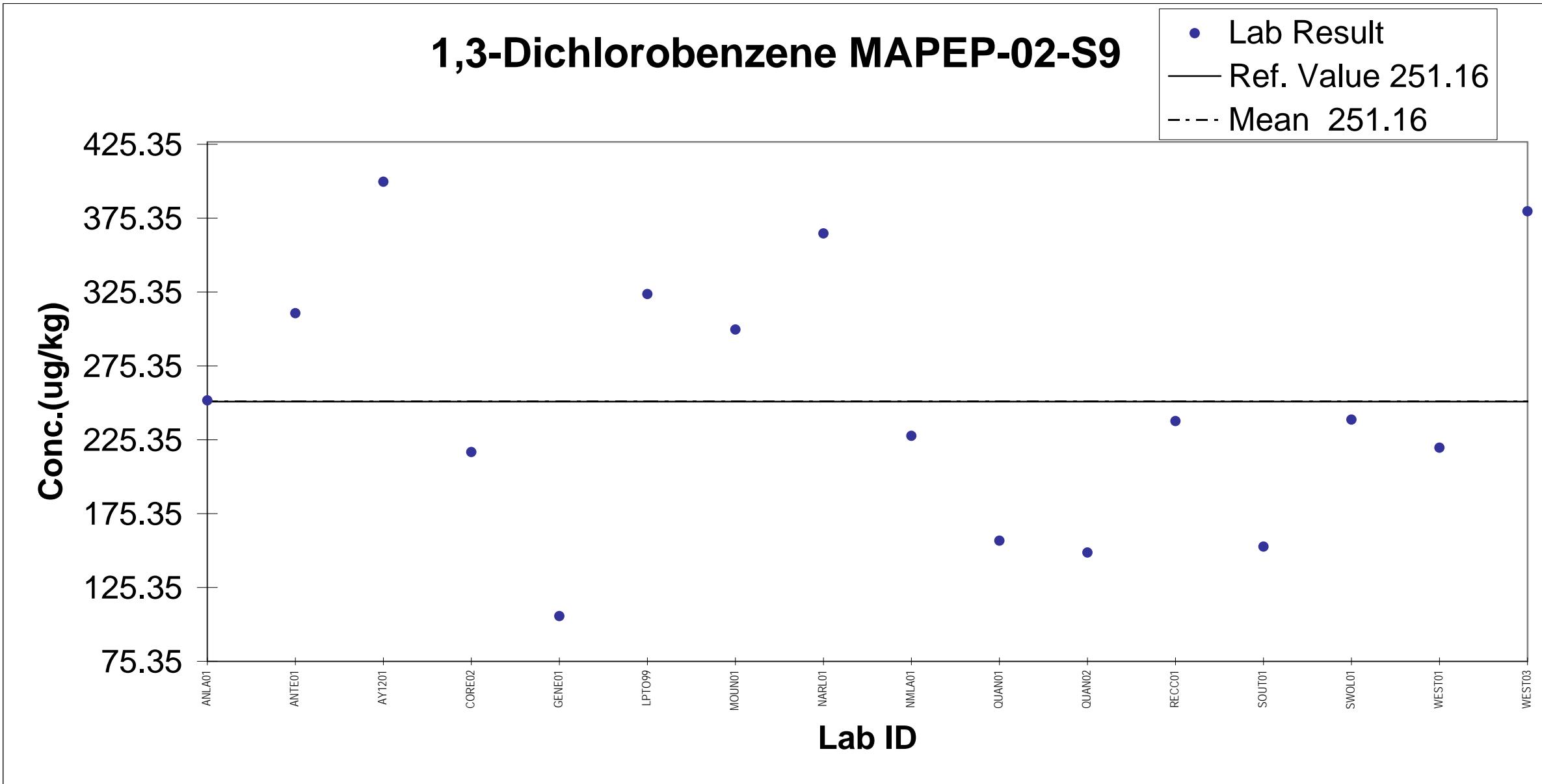
• Lab Result
— Ref. Value 153.71
- - - Mean 153.71



1,1,2,2-Tetrachloroethane MAPEP-02-SS

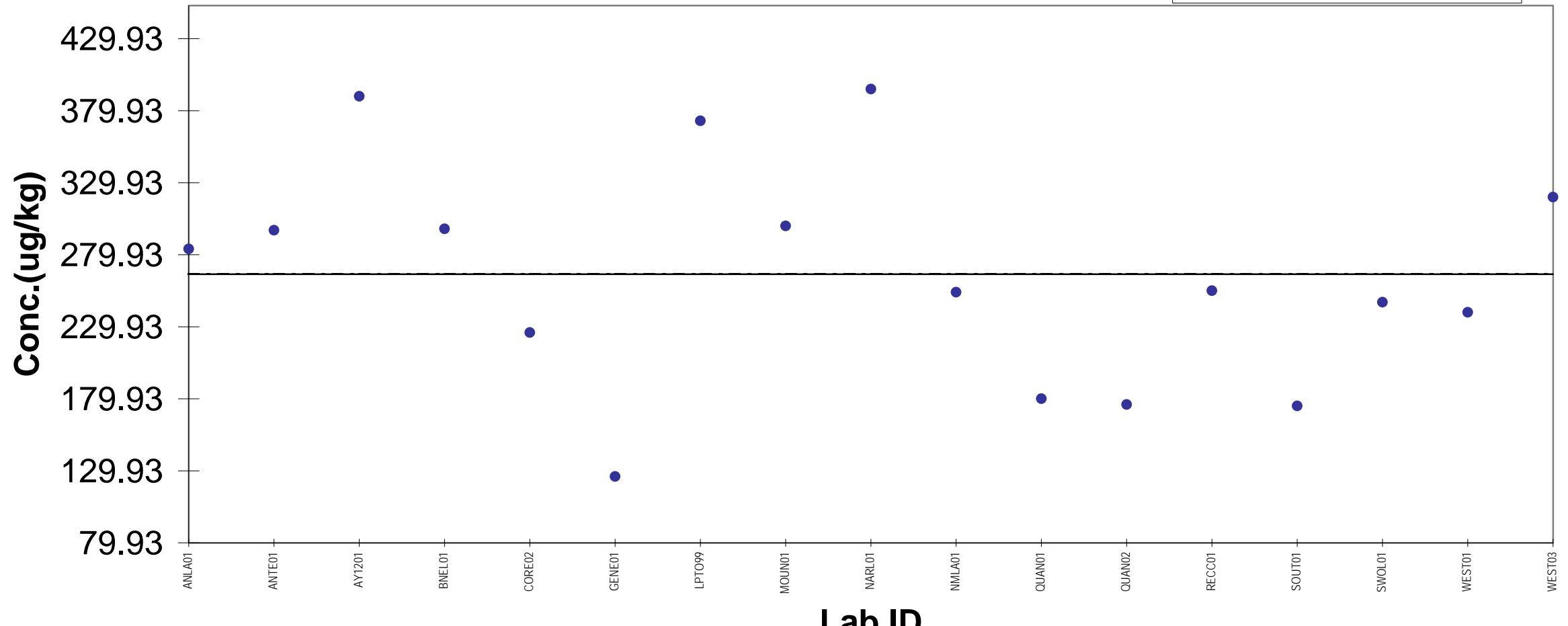
• Lab Result
— Ref. Value 971.83
- - - Mean 971.83





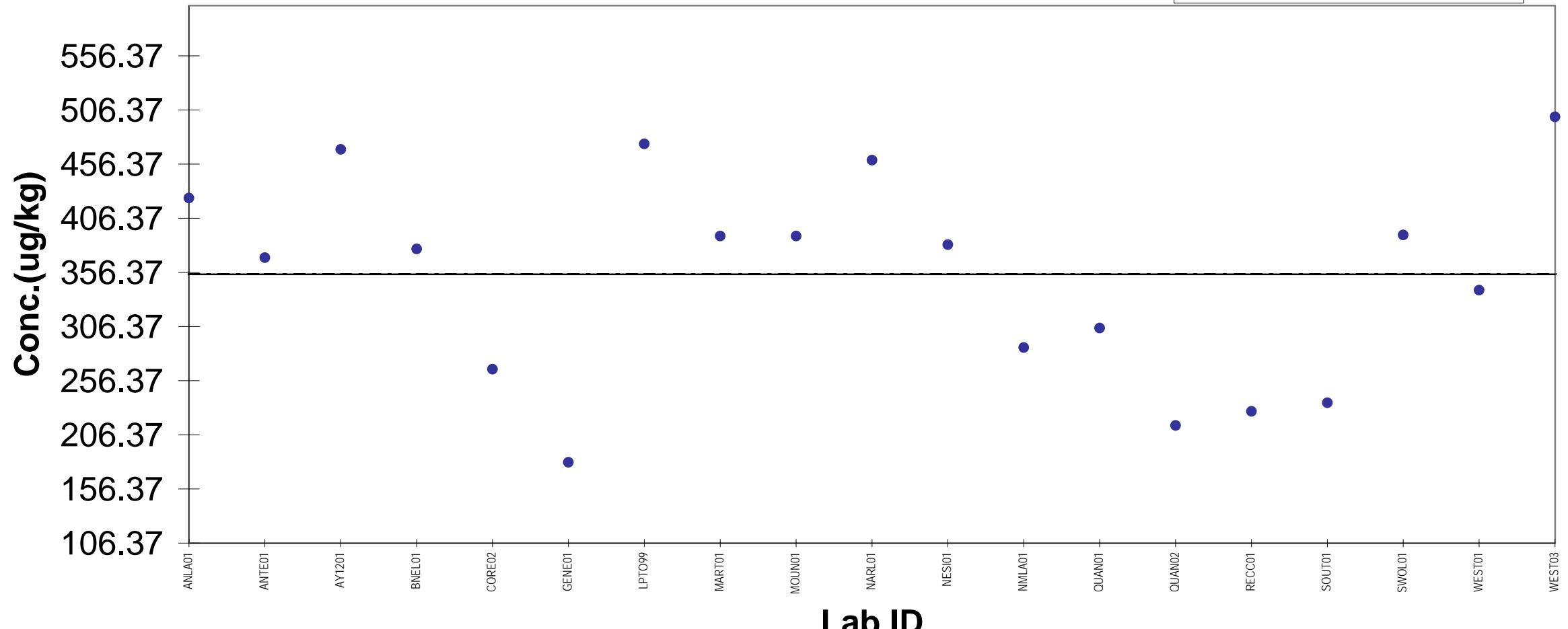
1,2-Dichlorobenzene MAPEP-02-S9

• Lab Result
— Ref. Value 266.44
- - - Mean 266.44



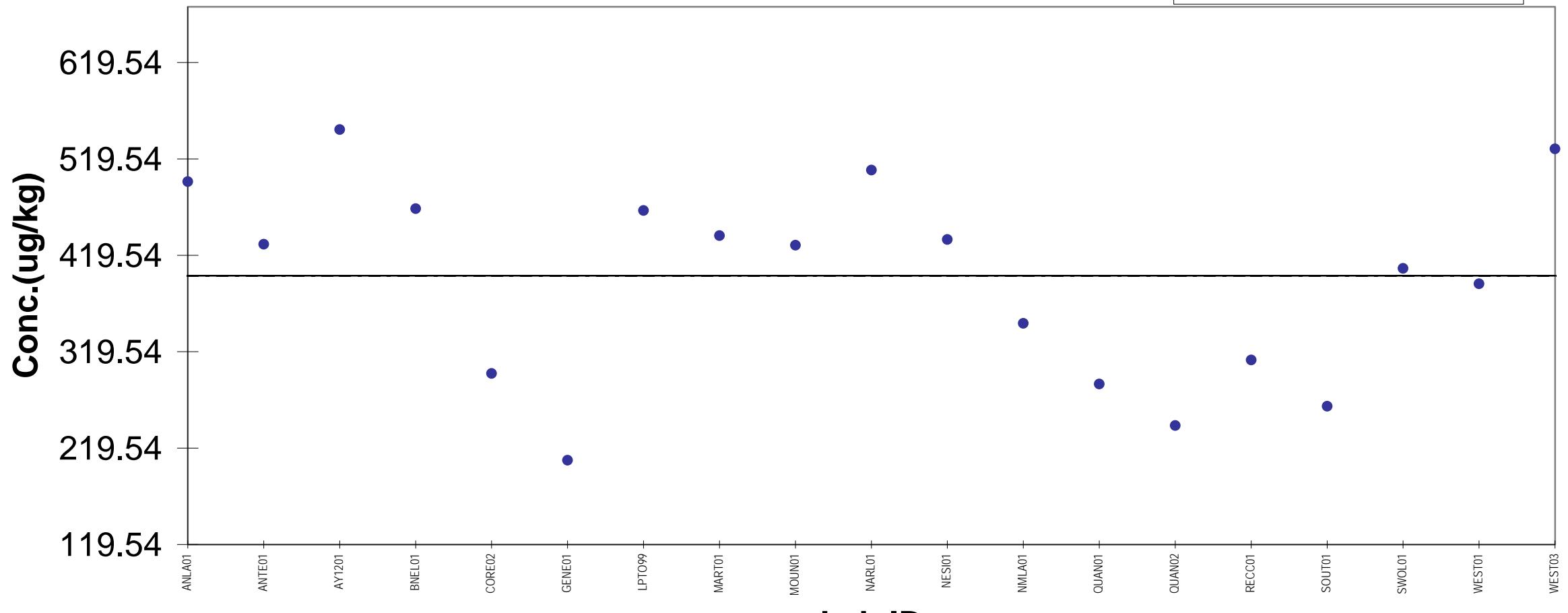
1,2,4-Trichlorobenzene MAPEP-02-S9

• Lab Result
— Ref. Value 354.57
- - - Mean 354.57



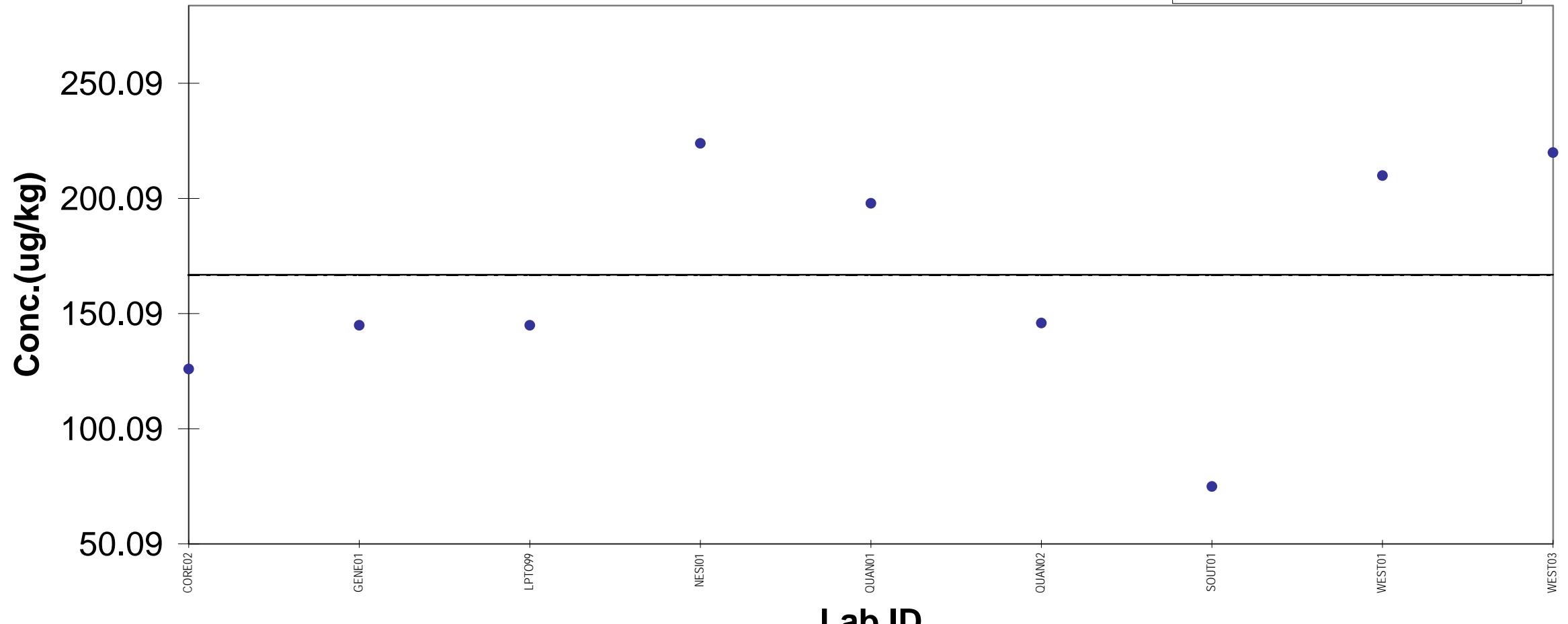
Naphthalene MAPEP-02-S9

• Lab Result
— Ref. Value 398.45
- - - Mean 398.45



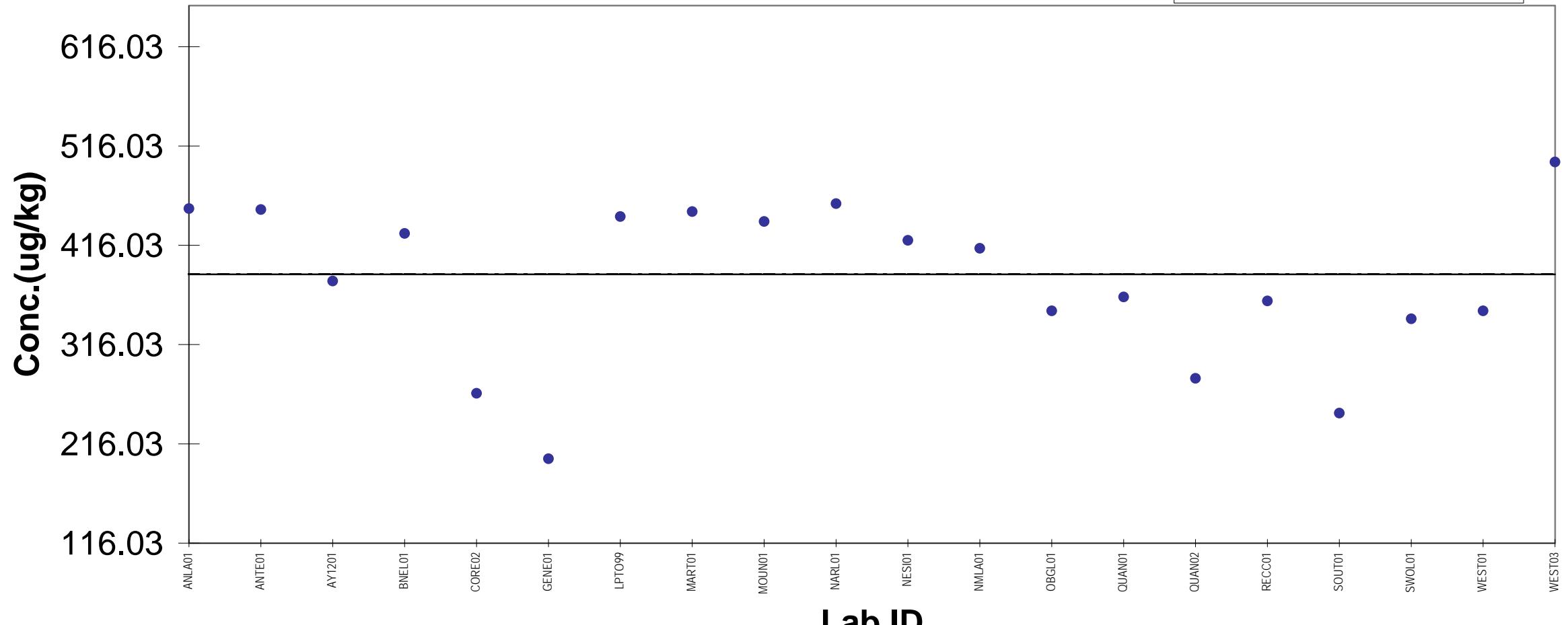
2,6-Dichlorophenol MAPEP-02-S9

• Lab Result
— Ref. Value 166.96
- - - Mean 166.96



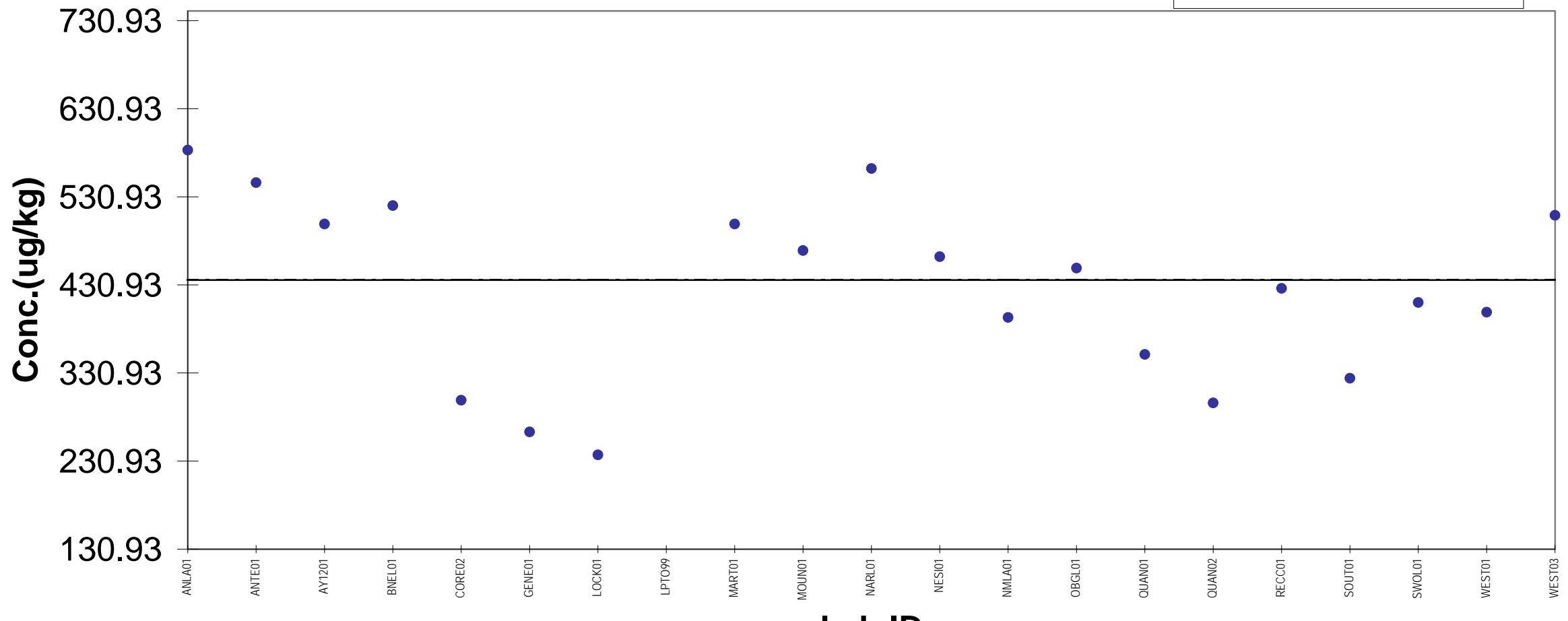
2-Chloronaphthalene MAPEP-02-S9

• Lab Result
— Ref. Value 386.75
- - - Mean 386.75



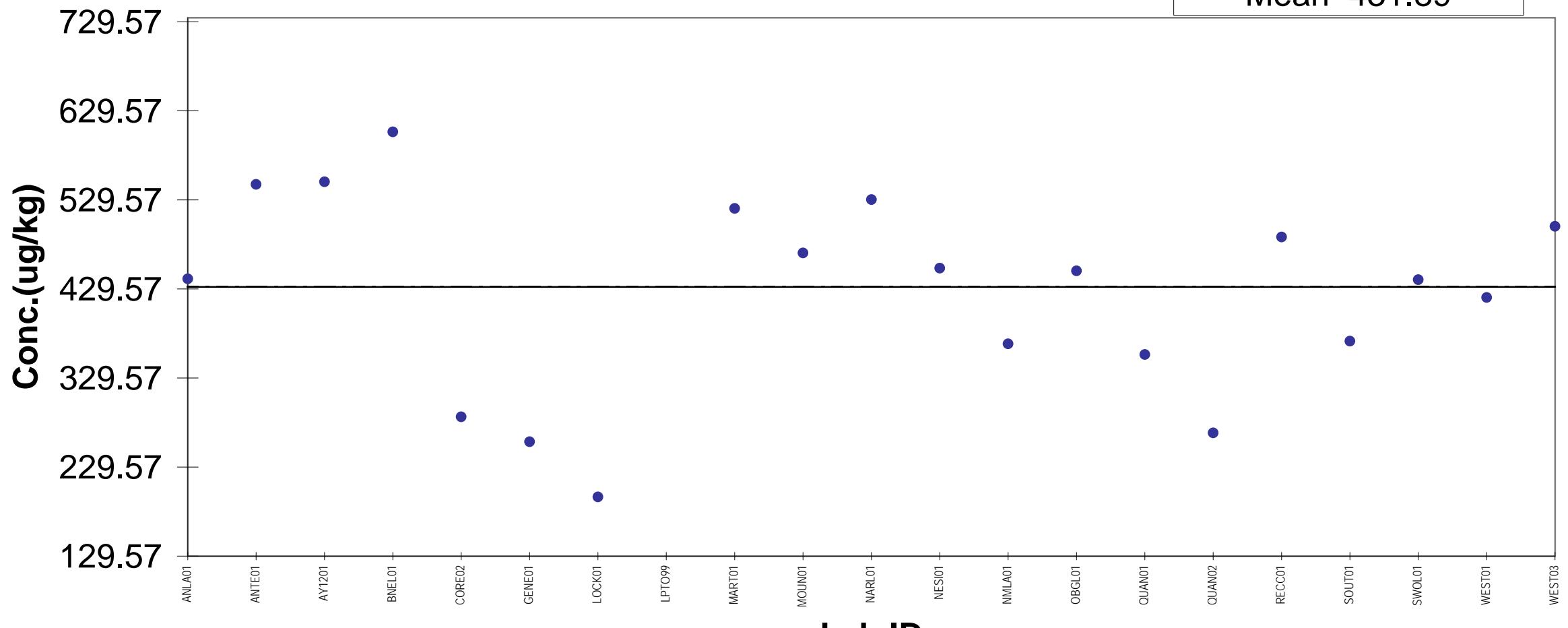
2,6-Dinitrotoluene MAPEP-02-S9

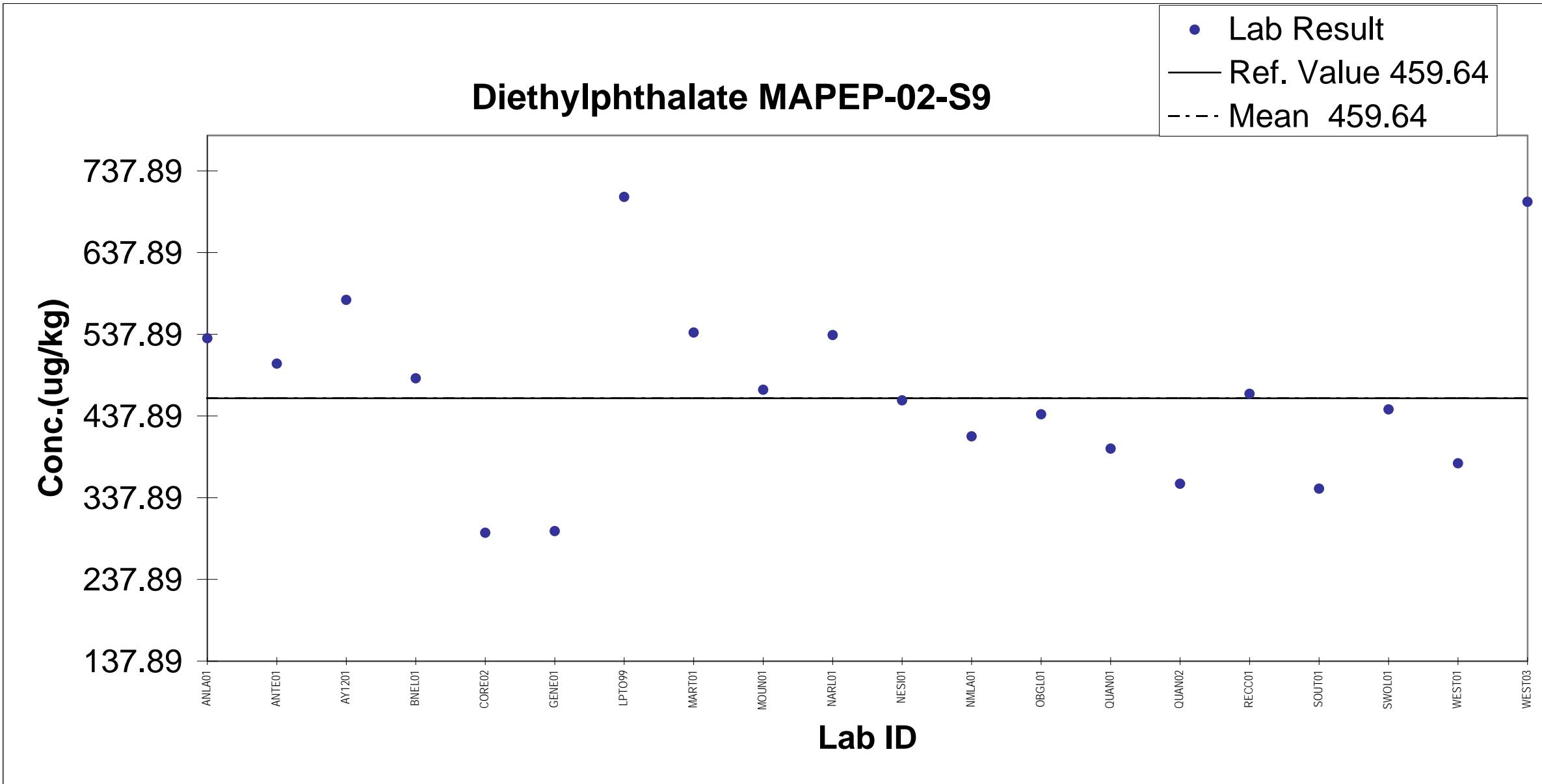
• Lab Result
— Ref. Value 436.42
- - - Mean 436.42

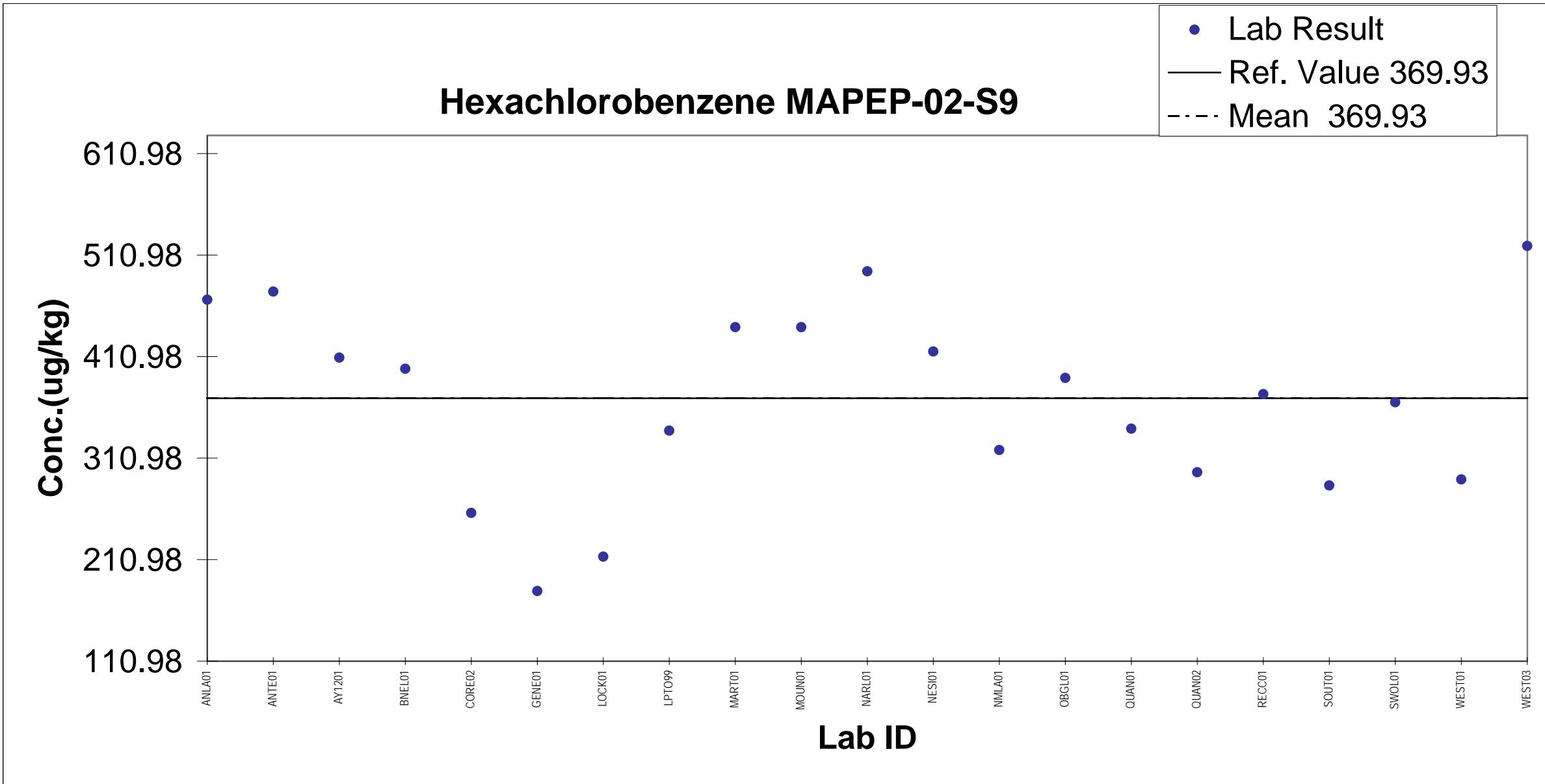


2,4-Dinitrotoluene MAPEP-02-S9

• Lab Result
— Ref. Value 431.89
- - - Mean 431.89

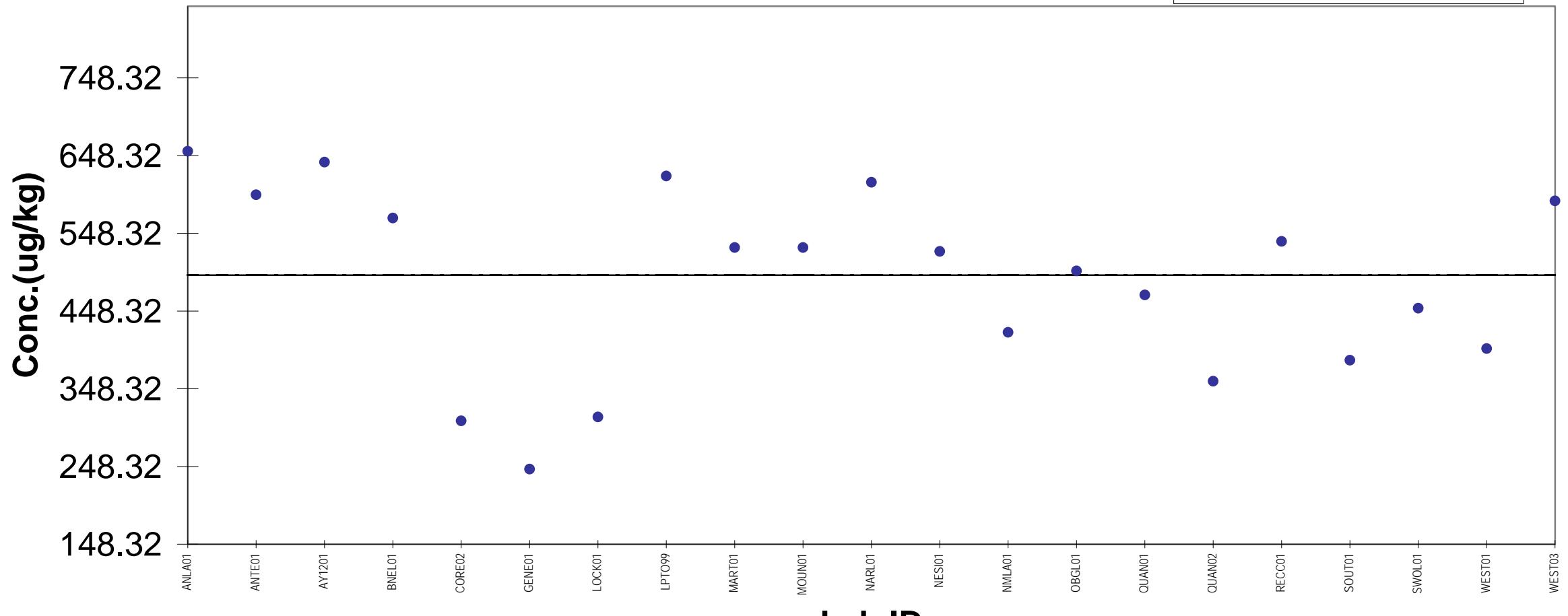






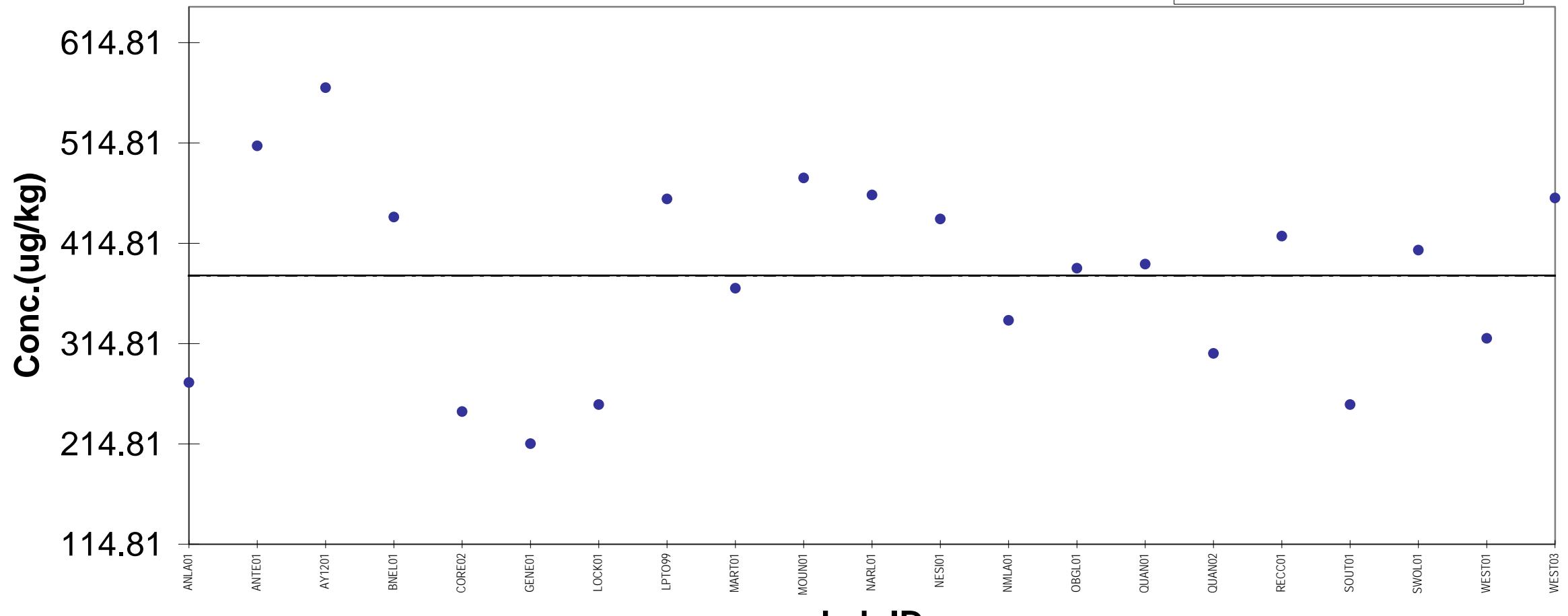
Phenanthrene MAPEP-02-S9

• Lab Result
— Ref. Value 494.41
- - - Mean 494.41



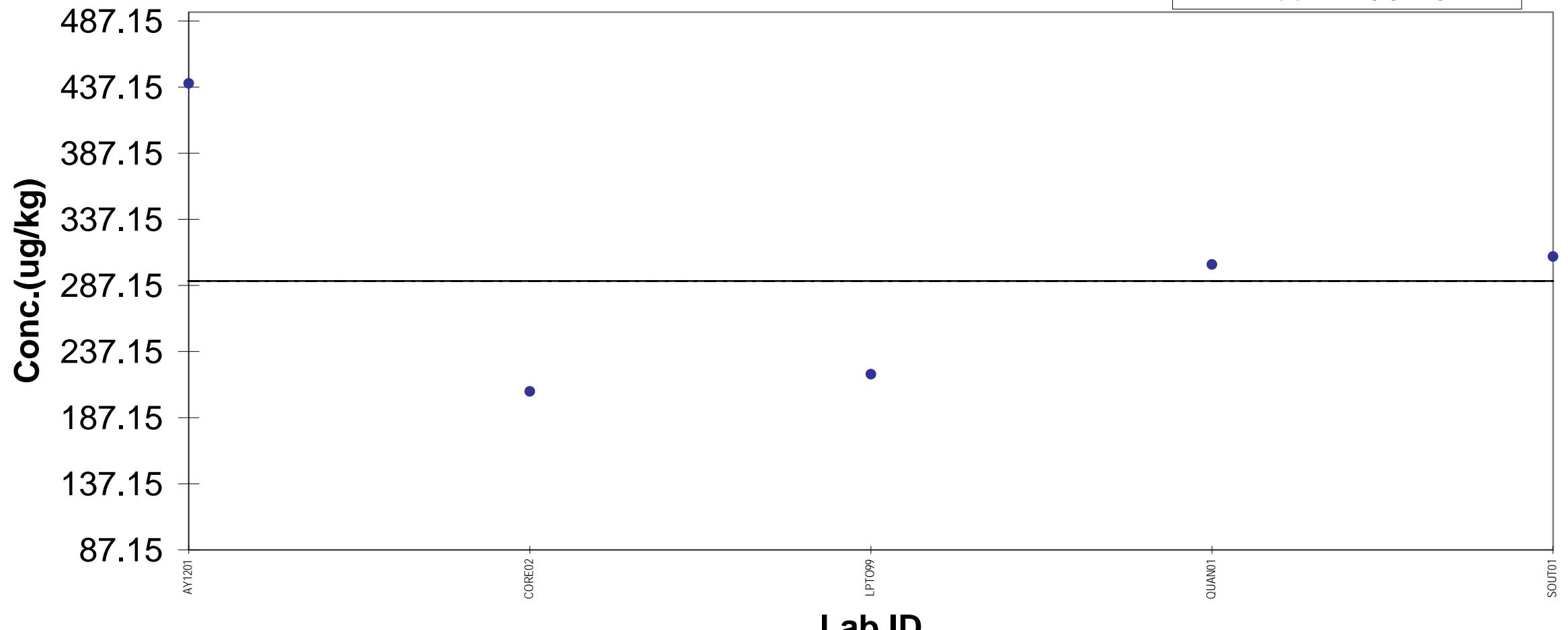
Anthracene MAPEP-02-S9

• Lab Result
— Ref. Value 382.71
- - - Mean 382.71



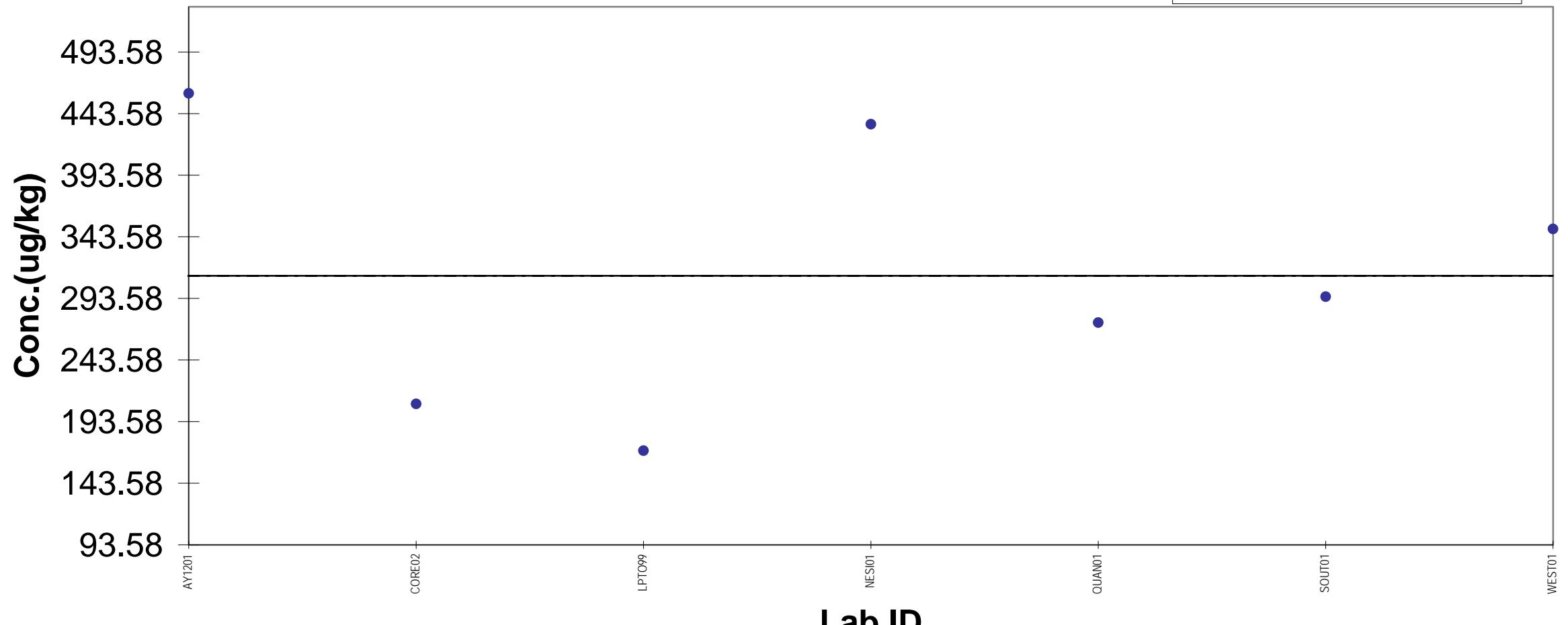
1,4-Dinitrobenzene MAPEP-02-S9

• Lab Result
— Ref. Value 290.49
- - - Mean 290.49



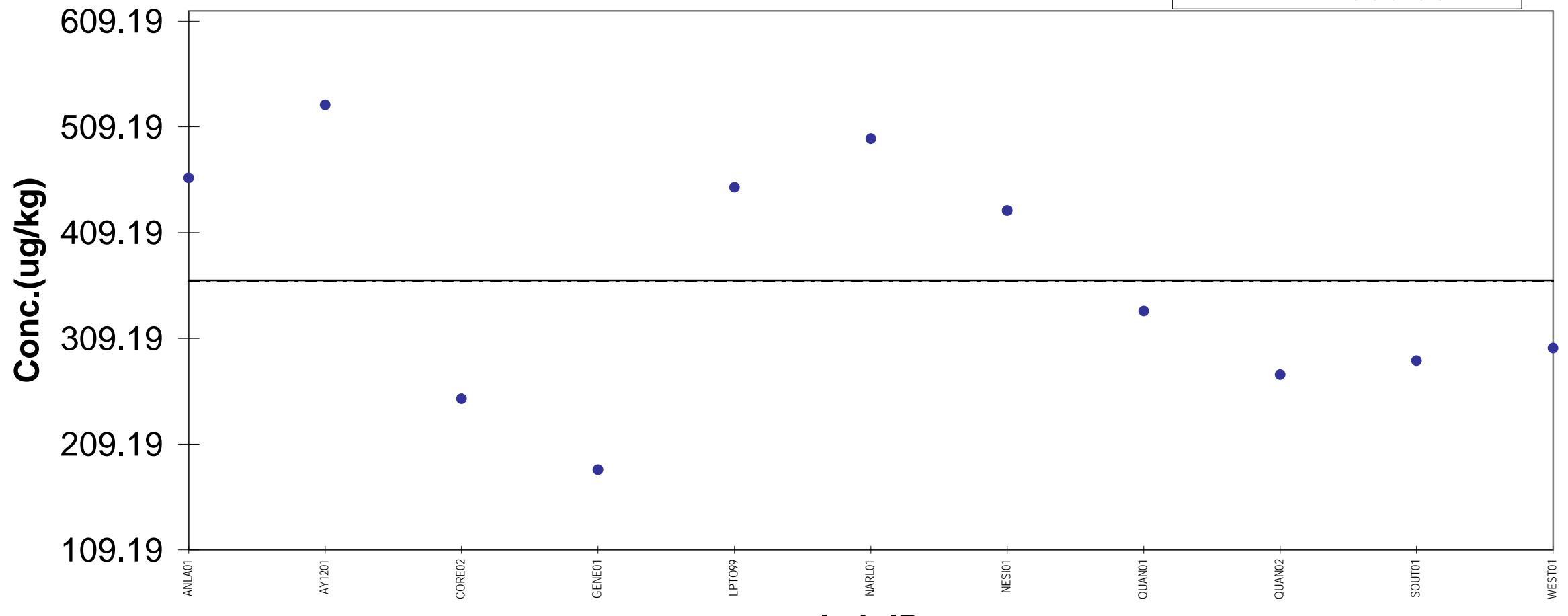
1,3-Dinitrobenzene MAPEP-02-S9

• Lab Result
— Ref. Value 311.93
- - - Mean 311.93



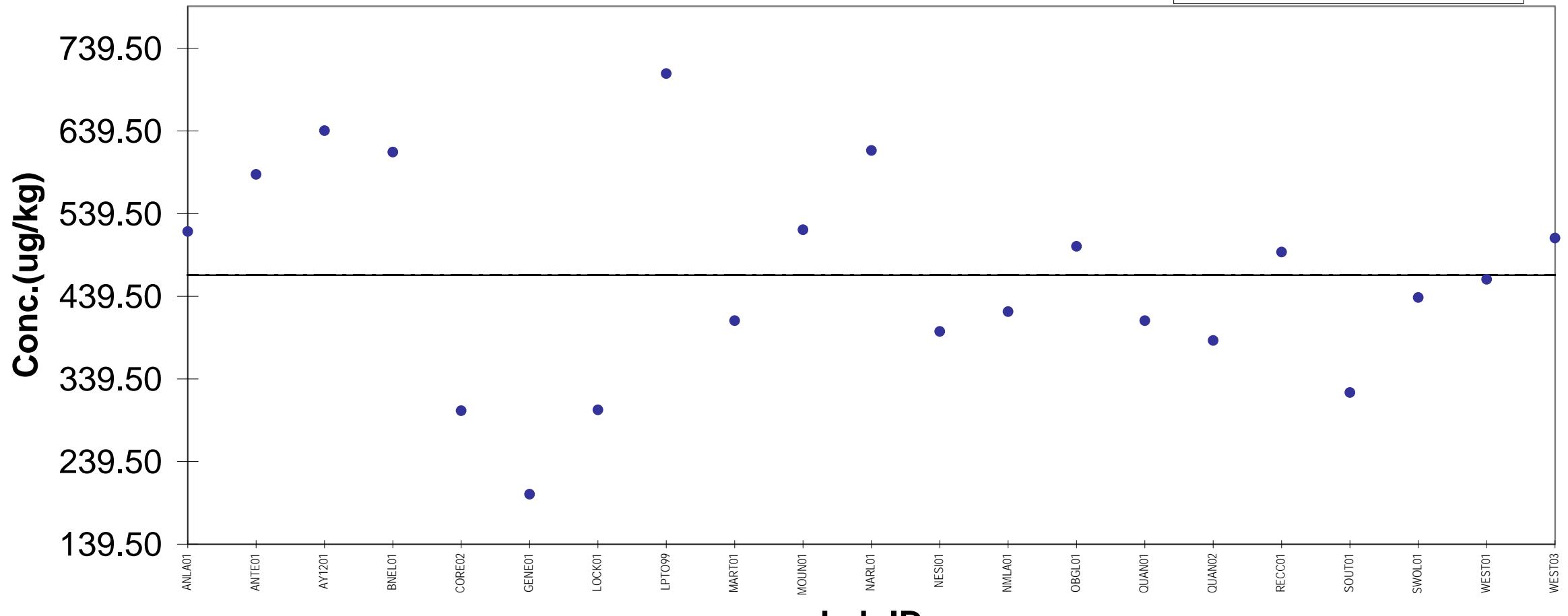
Pentachlorobenzene MAPEP-02-S9

• Lab Result
— Ref. Value 363.95
- - - Mean 363.95



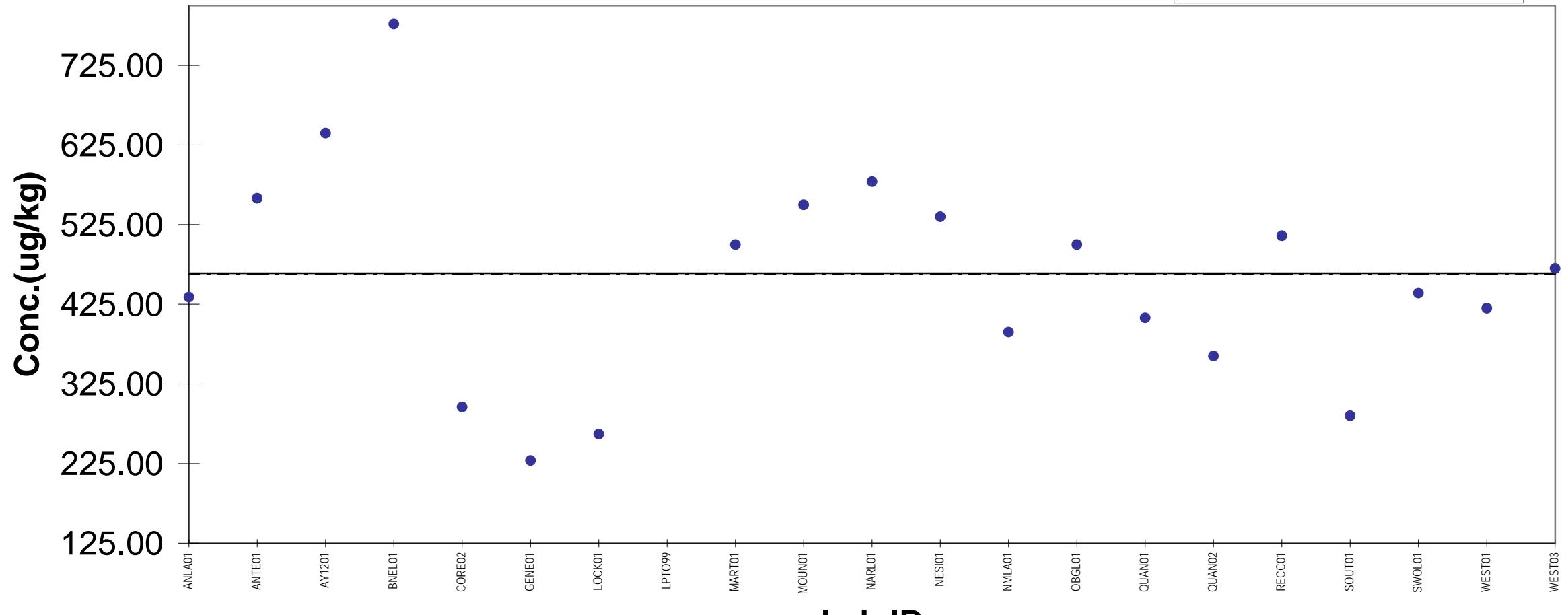
Pyrene MAPEP-02-S9

• Lab Result
— Ref. Value 465.01
- - - Mean 465.01



Benzo(a)anthracene MAPEP-02-S9

• Lab Result
— Ref. Value 464.05
- - - Mean 464.05



APPENDIX

D

MAPEP-02-S9 Reference Values

MAPEP-02-S9 Target Analyte Reference Values and Uncertainties

Stable inorganic and radiological analytes. Uncertainties are listed at one standard deviation.

Antimony	18.5 ± 0.1	milligrams/Kilogram
Arsenic	70.0 ± 0.5	milligrams/Kilogram
Barium	300 ± 3.0	milligrams/Kilogram
Beryllium ¹	False Positive Test	milligrams/Kilogram
Cadmium	17.3 ± 0.3	milligrams/Kilogram
Chromium	76.0 ± 1.6	milligrams/Kilogram
Lead	38.1 ± 0.4	milligrams/Kilogram
Nickel	24.0 ± 1.5	milligrams/Kilogram
Selenium	18.5 ± 0.1	milligrams/Kilogram
Silver	55.5 ± 0.3	milligrams/Kilogram
Thallium	46.3 ± 0.3	milligrams/Kilogram
Uranium-Total	18.5 ± 0.4	milligrams/Kilogram
Uranium-235	0.130 ± 0.003	milligrams/Kilogram
Uranium-238	18.4 ± 0.4	milligrams/Kilogram
Vanadium	53.9 ± 1.3	milligrams/Kilogram
Zinc	74.5 ± 4.0	milligrams/Kilogram
Americium-241	43.5 ± 0.8	Becquerel/Kilogram
Cesium-134	862 ± 13	Becquerel/Kilogram
Cesium-137	111 ± 2	Becquerel/Kilogram
Cobalt-57	246 ± 11	Becquerel/Kilogram
Cobalt-60	87.5 ± 1.5	Becquerel/Kilogram
Iron-55	1870 ± 40	Becquerel/Kilogram
Manganese-54	546 ± 10	Becquerel/Kilogram
Nickel-63	1180 ± 20	Becquerel/Kilogram
Plutonium-238	33.3 ± 0.7	Becquerel/Kilogram
Plutonium-239	72.9 ± 1.1	Becquerel/Kilogram
Potassium-40	652 ± 25	Becquerel/Kilogram
Strontium-90	False Positive Test	Becquerel/Kilogram
Uranium-234	229 ± 4	Becquerel/Kilogram
Uranium-238	220 ± 4	Becquerel/Kilogram
Zinc-65	809 ± 15	Becquerel/Kilogram

1) Beryllium background concentration was 0.95 ± 0.03 milligrams/Kilogram.

MAPEP-02-S9 Target Analyte Reference Values and Uncertainties

Semi-volatile uncertainties are the 95% confidence interval for the mean of the data
(i.e., Biweight Mean $\pm t_{(0.95)}^*$ Biweight Standard Error).

Component		
1,3-dichlorobenzene	251.2 \pm 53.4	micrograms/Kilogram
2,4-dimethylphenol	(1)	micrograms/Kilogram
1,2,4-trichlorobenzene	354.6 \pm 52.3	micrograms/Kilogram
naphthalene	398.4 \pm 55.5	micrograms/Kilogram
1,2-dichlorobenzene	266.4 \pm 43.1	micrograms/Kilogram
2,6-dichlorophenol	167.0 \pm *	micrograms/Kilogram
2-chloronaphthalene	386.8 \pm 40.1	micrograms/Kilogram
2,6-dinitrotoluene	436.4 \pm 57.1	micrograms/Kilogram
2,4-dinitrotoluene	431.9 \pm 56.5	micrograms/Kilogram
diethylphthalate	459.6 \pm 53.8	micrograms/Kilogram
hexachlorobenzene	369.9 \pm 46.1	micrograms/Kilogram
phenanthrene	494.4 \pm 60.5	micrograms/Kilogram
anthracene	382.7 \pm 49.8	micrograms/Kilogram
1,4-dinitrobenzene	290.5 \pm *	micrograms/Kilogram
1,3-dinitrobenzene	311.9 \pm *	micrograms/Kilogram
pentachlorobenzene	364.0 \pm 90.0	micrograms/Kilogram
pyrene	465.0 \pm 61.0	micrograms/Kilogram
benzo(a)anthracene	464.0 \pm 70.8	micrograms/Kilogram
Bis(2-ethylhexyl)phthalate	2957 \pm 570	micrograms/Kilogram

⁽¹⁾ Target analytes were added to the standard, but they were either not detected by the participants or the number of laboratories that reported results were insufficient to generate statistics.

* Eight or less laboratories returned data for this target analyte. This number is insufficient to estimate the Biweight standard deviation.